



DiaDent[®]

DiaDent Group International
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DiaRoot[®] *BioAggregate*

Root Canal Repair Material

PRECISION. PURITY. RESULTS



ABOUT DIAROOT ...

DiaRoot BioAggregate Root Canal Repair Material is a biocompatible pure white powder composed of ceramic nano-particles. Upon mixing DiaRoot with BioA Liquid, the hydrophilic BioAggregate Powder promotes cementogenesis and forms a hermetic seal inside the root canal. Its effectiveness to clinically block off bacterial infection, ease of material manipulation and superior quality make DiaRoot the most innovative and unique root canal repair material.

A large tree trunk in a field at sunset. The tree trunk is on the left side of the image, and the background shows a field and a sunset sky.

FEATURES & BENEFITS

- **Aluminum-Free Composition**

The effects of aluminum toxicity cause health problems. Consequently, DiaRoot was designed to be completely aluminum-free and has excellent biocompatibility with the vital periradicular tissue.

- **Biocompatibility**

DiaRoot BioAggregate is more biocompatible than any other root end filling and repair materials. It does not produce any adverse site effect on microcirculation of the connective tissue. It also has excellent biocompatibility with the vital periradicular tissue.

- **Optimum Working Time and Setting Time**

The working time of DiaRoot is at least 5 minutes. Upon mixing DiaRoot and BioA Liquid, a thick paste-like mixture is formed. If additional working time is required, simply cover the mixture with a moist gauze sponge while unattended.

- **Excellent Workability and Handling Properties**

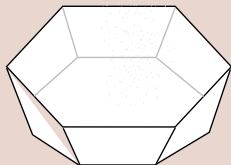
DiaRoot BioAggregate mixture is easy to manipulate and apply. Its ease of use will ensure that every procedure to be a successful one.

- **Pure White Teeth Colored Powder**

DiaRoot is not off-white, like other root canal repair materials. DiaRoot complements the natural color of teeth and all the ingredients are pure white in color.

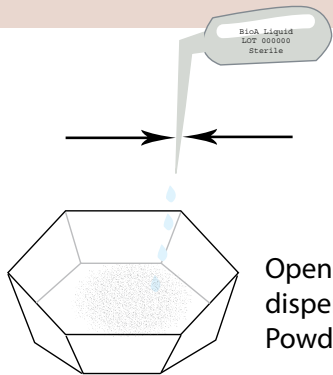
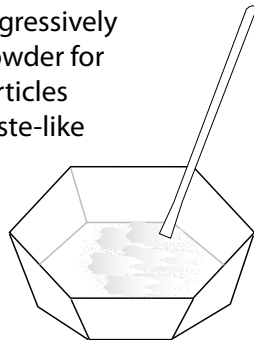
Mixing Instructions:

- 1 Open one pouch of DiaRoot Powder and dispense into the mixing cup provided.



Using the spatula provided, progressively mix BioA Liquid into DiaRoot Powder for about 2 minutes until all the particles are hydrated forming a thick paste-like mixture.

3



2

Open one vial of BioA Liquid and dispense the contents into DiaRoot Powder.

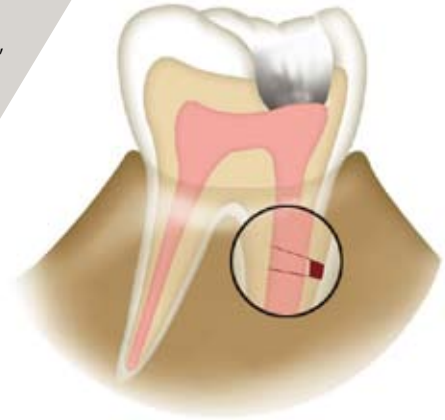
! Caution !

BioA Liquid provided (1 vial x 0.38 ml) is the exact amount required for 1.0 g of powder. Excessive addition of BioA Liquid may alter the setting time and material properties.

NOTE: The working time of DiaRoot BioAggregate Root Canal Repair Material is at least 5 minutes. The complete setting time is between 4 to 72 hours. If additional working time is required, cover the mixture with a moist gauze sponge while unattended; this will retard the dehydration process.

REPAIR OF ROOT PERFORATION

1. Isolate the operative area with a rubber dam.
2. Prepare the root canal system for treatment.
3. Obturate the root canal apically up to the area of perforation.
4. Prepare DiaRoot according to the Mixing Instructions.
5. Using **a carrier of your choice**, dispense DiaRoot into the area of perforation, and compact the material with a **plugger**.
6. Verify the placement of DiaRoot with a radiograph. If the placement is not sufficient, irrigate DiaRoot out of the root canal and repeat the placement procedure.
7. Place a **moist cotton pellet** inside the root canal and seal the root canal with a **temporary restoration** for a minimum of 4 hours.
8. After the **minimum setting time of 4 hours**, verify if DiaRoot is properly set.
9. Once DiaRoot has set hard, obturate the root canal with a permanent sealer and perform restoration.



ROOT END FILLING

tear-off line ▼▼▼

1. **Surgically obtain access** to the root end and **resect the root depth of 3 mm.**
2. Perform a root end cavity preparation to a depth of **3-5 mm. Ultrasonic tips** are recommended; use at **low power** to minimize the risk of root cracking.
3. Clean and remove any debris in the area of the prepared cavity.
4. Achieve **hemostasis**; dry, and isolate the cavity from all fluids.
5. Prepare DiaRoot according to the Mixing Instructions.
6. Using a carrier, place an adequate amount of DiaRoot into the root end cavity.
7. Gently compact DiaRoot into the root end cavity with a **retro-filling plugger**, repeat this procedure until the root end cavity is completely sealed.
8. Remove and clean any excess material with **moist cotton pellets.**
9. Verify the placement of DiaRoot with a radiograph. If the placement is not sufficient, irrigate DiaRoot out of the root canal and repeat the placement procedure.
10. Close the surgical opening after confirming that the root end cavity is sufficiently sealed.



REPAIR OF ROOT RESORPTION

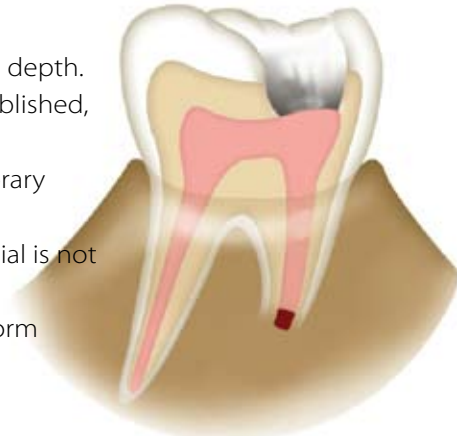
1. Isolate the operative area with a rubber dam.
2. Prepare the root canal system for treatment.
3. To disinfect thoroughly, fill the root canal with **Diapex** or calcium hydroxide and seal the root canal with a temporary restoration for a one-week period.
4. After **one week**, remove the calcium hydroxide and irrigate the root canal thoroughly.
5. Dry the root canal and locate the site of resorption.
6. Obturate the root canal apically up to the site of resorption.
7. Prepare DiaRoot according to the Mixing Instructions.
8. Using a carrier, place DiaRoot into the **resorption site** and compact the material into the defect.
9. Verify the placement of DiaRoot with a radiograph. If the placement is not sufficient, irrigate DiaRoot out of the root canal and repeat the placement procedure.
10. Place a **moist cotton pellet** inside the root canal and seal the root canal with a temporary restoration for a minimum of **4 hours**.
11. After the minimum setting time of 4 hours, verify if DiaRoot is properly set. The material should be completely hardened; if not, irrigate the root canal and repeat the placement procedure.
12. Once DiaRoot has set hard, obturate the root canal with a **permanent sealer** and perform restoration.



APEXIFICATION

tear-off line

1. Isolate the operative area with a rubber dam and prepare the root canal system for treatment.
2. To disinfect thoroughly, fill the root canal with **Diapex** or calcium hydroxide and seal the root canal with a **temporary restoration** for a one-week period.
3. After **one week**, remove the calcium hydroxide and irrigate the root canal thoroughly.
4. Prepare DiaRoot according to the Mixing Instructions.
5. Using a carrier of your choice, place DiaRoot into the **apical area** of the root canal and compact the material with a **plugger**.
6. Repeat placement procedure until DiaRoot forms an **apical plug** of at least **3-5 mm** in depth.
7. Verify the placement of DiaRoot with a radiograph. If a sufficient apical plug is not established, irrigate DiaRoot out of the root canal and repeat the placement procedure.
9. Place a **moist cotton pellet** inside the root canal and seal the root canal with a temporary restoration for a minimum of **4 hours**.
9. After the minimum setting time of 4 hours, verify if DiaRoot is properly set. If the material is not completely hardened, irrigate the root canal and repeat the placement procedure.
10. Once DiaRoot is set hard, obturate the root canal with a **permanent sealer** and perform restoration.



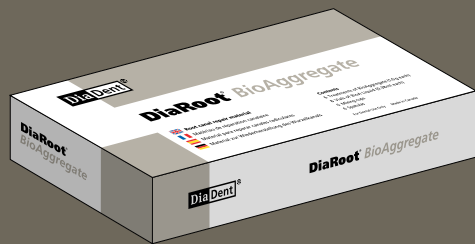
PULP CAPPING

1. Isolate the operative area with a rubber dam.
2. Prepare the cavity by removing any decay with a **high-speed bur** under a constant cooling water spray.
3. Clean the cavity and pulp exposure site with a **disinfectant**. Control any heavy hemorrhage.
4. Prepare DiaRoot according to the Mixing Instructions; the material should be moist enough to allow workability, but does not readily flow.
5. Using **a carrier of your choice**, deliver the material over the **exposed pulp**.
6. Use a **moist cotton pellet** to remove excess DiaRoot.
7. Apply a **thin light-cured restoration** to cover DiaRoot, and **light cure to seal the restoration**.
8. **Etch** the remaining cavity walls then rinse thoroughly.
9. **Dry** the cavity and **apply primer** throughout the cavity.
10. Complete the restoration with a **permanent light cured restorative composite**.
11. Radiograph the tooth to **verify the pulp vitality** at subsequent appointments and follow up every 3 to 6 months or as necessary.



INDICATIONS ...

- Repair of Root Perforation
- Repair of Root Resorption
- Root End Filling
- Apexification
- Pulp Capping



ORDER INFORMATION:

1004-101 DiaRoot Regular Kit

- 6 Treatments of BioAggregate (1.0 g each)
- 8 Vials of BioA Liquid (0.38 ml each)
- 6 Mixing cups
- 6 Spatulas

1004-102 DiaRoot Powder Refill

- 6 Treatments of BioAggregate (1.0 g each)

1004-103 DiaRoot Liquid

- 6 Vials of BioA Liquid (0.38 ml each)

1004 - 104: DiaRoot Intro Kit

- 1 Treatment of BioAggregate (1.0 g each)
- 1 Vial of BioA Liquid (0.38 ml each)
- 1 Mixing cup
- 1 Spatula

DiaRoot vs. MTA COMPARISON CHART

Compound	Compound Present		Function & Properties
	DiaRoot	MTA	
Gel-like calcium silicate hydrate	Yes	Yes	Main structural component; provides strength, hardness and sealing properties of set cement.
Gel-like calcium Aluminate hydrate	No	Yes	Fast setting. Aluminum ion in soluble form is toxic.
Calcium hydroxide	Yes (less than MTA)	Yes	Hydration product of calcium silicates. Structurally weak.
Hydroxyapatite (HAP)*	Yes	No	Reactively removes part of Ca(OH) ₂ from setting (hydrating) calcium silicates. In highly dispersed in-situ precipitated form strengthens the calcium silicate hydrogel.
Calcium sulfate	No	Yes	Adjusts the setting time.
Bismuth oxide	No	Yes	Provides radiopacity.
Tantalum oxide	Yes	No	Provides radiopacity.
Amorphous silicon oxide	Yes	No	Reactively removes part of Ca(OH) ₂ from setting (hydrating) calcium silicates.

***What is HYDROXYAPATITE (HAP)?**

Hydroxyapatite is used extensively as a bone grafting material. Bone is composed of a matrix, mainly made up of a protein called collagen. It is strengthened by deposits of calcium and phosphate salts, called hydroxyapatite.

When DiaRoot BioAggregate Powder is hydrated, the BioA Liquid precipitates calcium phosphate, which is what comprises human bone. During this reaction Hydroxyapatite is created and water is formed. The water supplied through this dynamic reaction contributes to the hydration reaction speed, and thus the setting time and strength of DiaRoot.



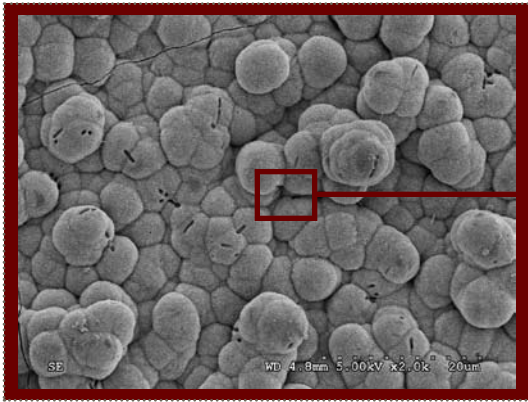
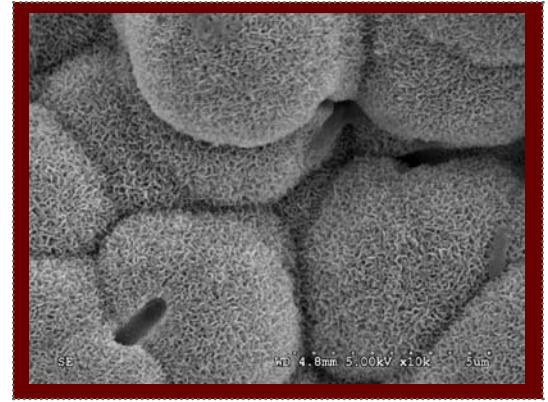


Figure A

Figure B



The bone-bonding ability of DiaRoot/BioAggregate was evaluated in-vitro by immersing the samples in a simulated body fluid (SBF) at 37°C and examining the ability of apatite to form on its surface. The concentration and pH of SBF is nearly equal to those of human blood plasma as described by Kokubo et al. [Biomaterials 27 (2006) 2907–2915]. A layer apatite was formed on surface of DiaRoot BioAggregate after immersion in SBF for 7 days under SEM examination as shown in Figure A and B. It indicated that DiaRoot Bioaggregate has an ability to produce an apatite layer on its surface in the living body, and bonds to living bone through this apatite layer.

MY NOTES:

A series of ten horizontal dotted lines spaced evenly down the page, providing a guide for writing notes. The lines are light gray and extend across the width of the page.

Call your personal dealer sales representative
for further information and pricing today!

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