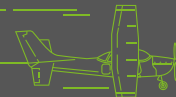


# GLUMA® Bond Journey

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**KULZER**  
MITSUI CHEMICALS GROUP

## GLUMA Bond Journey

### Do you know how to use universal adhesives perfectly?

Adhesive dentistry is growing steadily due to the need for increasingly minimally invasive treatment. Compromised tissue, typically due to adhesive preparations has resulted in a slow transition from direct and indirect macro-retentive restorations to micro-retentive restorations. This transition is changing rehabilitations from subtractive to additive treatments based on the use of adhesive systems. Different adhesive approaches can be used, with their advantages and disadvantages. The goal is not what type of material to use but how to use it and comprehend and adhere to application protocols.

Universal adhesives represent the latest generation of adhesives developed with the aim of simplifying procedures for direct and indirect restorations and repairs.

They are essentially one-step adhesives, combining acid etchant, primer and bonder in a single solution and can be used by etching enamel only, by etching enamel and dentine or without phosphoric acid etching at all. Another characteristic of universal adhesives is that they can be used not only on the dental structure (enamel and dentine) but also on composites, glass-ceramics, zirconia and metals.

However, since the dentist may apply different adhesive protocols (etch&rinse vs. selective enamel etch vs. self-etch) depending on the clinical situation, further confusion may arise during clinical application. Hence, a brochure is needed to help the clinician use GLUMA Bond Universal correctly in different situations: direct restorations, cementation of indirect restorations and repairs on different substrates.



*Prof. Nicola Scotti  
DDS, PhD,  
Associate Professor,  
University of Torino, Italy*

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Direct restoration using the self-etch technique

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Direct restoration using the selective enamel etch technique

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Direct restoration using etch&rinse technique

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Restorations and cementation cases courtesy of **Prof. Nicola Scotti**, University of Turin, Italy.  
Repair cases courtesy of **Dr. Stefano Daniele**, Milan, Italy.

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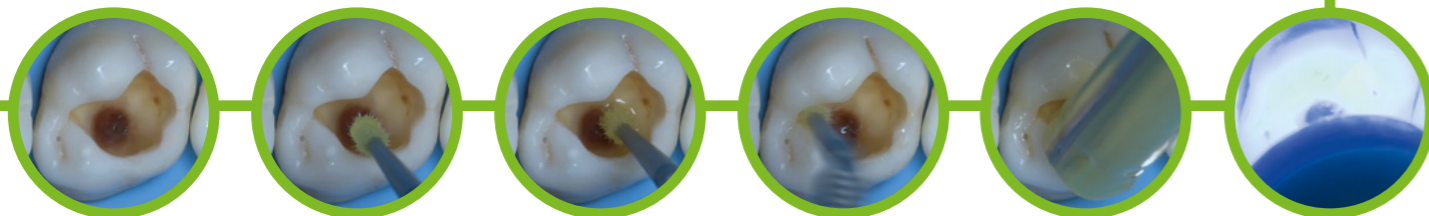
	Direct restoration using the self-etch technique	Direct restoration using the selective enamel etch technique	Direct restoration using etch and rinse	Adhesive cementation of lithium disilicate crowns	Adhesive cementation of lithium disilicate veneers	Adhesive cementation of zirconia crowns	Adhesive cementation of hybrid ceramics (composite)	Adhesive cementation of polymer infiltrated ceramics (e.g. Vita Enamic)
MATERIAL SIDE				<p><b>STEP 1</b> Check instruction for use of the ceramic manufacturer.</p> <p><b>STEP 2</b> Etch with hydro-fluoric acid. Rinse thoroughly with water. <b>Tip:</b> Ultrasonic cleaner for 5 minutes.</p> <p><b>STEP 3</b> Apply GLUMA Ceramic Primer and allow to evaporate for 20 sec., air dry</p> <p><b>STEP 4</b> Apply GLUMA Bond Universal, rub in for 20 sec., air dry and light cure for 10 sec.</p> <p><b>STEP 5</b> Apply dual-curing adhesive resin cement</p>	<p><b>STEP 1</b> Check instruction for use of the ceramic manufacturer.</p> <p><b>STEP 2</b> Etch with hydro-fluoric acid. Rinse thoroughly with water. <b>Tip:</b> Ultrasonic cleaner for 5 minutes.</p> <p><b>STEP 3</b> Apply GLUMA Ceramic Primer and allow to evaporate for 20 sec., air dry</p> <p><b>STEP 4</b> Apply GLUMA Bond Universal, rub in for 20 sec., air dry and light cure for 10 sec.</p> <p><b>STEP 5</b> Apply dual-curing adhesive resin cement</p>	<p><b>STEP 1</b> Check instruction for use of the ceramic manufacturer.</p> <p><b>STEP 2</b> Sandblasting. Rinse thoroughly with water. <b>Tip:</b> Never use phosphoric acid on zirconia and metal surfaces</p> <p><b>STEP 3</b> Apply GLUMA Universal, rub in for 20 sec., air dry and polymerize for 10 sec.</p> <p><b>STEP 3</b> Apply dual-curing self-adhesive resin cement or dual-curing adhesive resin cement</p>	<p><b>STEP 1</b> Check instruction for use of the ceramic manufacturer regarding surface pre-treatment: Sandblasting. Rinse thoroughly with water.</p> <p><b>STEP 2</b> <b>Optional:</b> Apply GLUMA Ceramic Primer for 20 sec., air dry</p> <p><b>STEP 3</b> Apply GLUMA Universal, rub in for 20 sec., air dry and polymerize for 10 sec.</p> <p><b>STEP 4</b> Apply flowable or pre-heated composite (alternatively: dual-curing self-adhesive resin cement or dual-curing adhesive resin cement)</p>	<p><b>STEP 1</b> Check instruction for use of the ceramic manufacturer regarding surface pretreatment: polymer infiltrated ceramics require hydrofluoric acid etching</p> <p><b>STEP 2</b> Apply GLUMA Ceramic Primer for 20 sec., air dry</p> <p><b>STEP 3</b> Apply GLUMA Universal, rub in for 20 sec., air dry and polymerize for 10 sec.</p> <p><b>STEP 4</b> Apply flowable or pre-heated composite (alternatively: dual-curing self-adhesive resin cement or dual-curing adhesive resin cement)</p>

	Isolate tooth (e.g. rubber dam)							
TTOOTH SIDE	<p><b>STEP 1</b> Apply GLUMA Bond Universal, rub in for 20 sec., air dry and light cure for 10 sec.</p> <p><b>STEP 2</b> Apply Charisma Topaz, Charisma Diamond or Charisma Opal Flow</p>	<p><b>STEP 1</b> Etch enamel with phosphoric acid for 20–30 sec.</p> <p><b>STEP 2</b> Rinse and dry</p> <p><b>STEP 3</b> Apply GLUMA Bond Universal, rub in for 20 sec., air dry and light cure for 10 sec.</p> <p><b>STEP 4</b> Apply Charisma Topaz, Charisma Diamond or Charisma Opal Flow</p>	<p><b>STEP 1</b> Etch enamel with phosphoric acid for 20–30 sec. and the dentine for 15 sec.</p> <p><b>STEP 2</b> Rinse and dry</p> <p><b>STEP 3</b> Apply GLUMA Bond Universal, rub in for 20 sec., air dry and light cure for 10 sec.</p> <p><b>STEP 4</b> Apply Charisma Topaz, Charisma Diamond or Charisma Opal Flow</p>	<p><b>STEP 1</b> Etch enamel with phosphoric acid for 20–30 sec. and the dentine for 15 sec.</p> <p><b>STEP 2</b> Rinse and dry</p> <p><b>STEP 3</b> Apply GLUMA Bond Universal, rub in for 20 sec., air dry and light cure for 10 sec.</p>	<p><b>STEP 1</b> Etch enamel with phosphoric acid for 20–30 sec. and the dentine for 15 sec.</p> <p><b>STEP 2</b> Rinse and dry</p> <p><b>STEP 3</b> Apply GLUMA Bond Universal, rub in for 20 sec., air dry and light cure for 10 sec.</p>	<p><b>STEP 1</b> Rinse and dry.</p> <p><b>STEP 2</b> <b>Usage of adhesive resin cement:</b> Apply GLUMA Bond Universal, rub in for 20 sec., air dry and light cure for 10 sec.</p> <p><b>Usage of self-adhesive resin cement:</b> No adhesive application.</p>	<p><b>STEP 1</b> Rinse and dry.</p> <p><b>STEP 2</b> <b>Usage of adhesive resin cement:</b> Apply GLUMA Bond Universal, rub in for 20 sec., air dry and light cure for 10 sec.</p> <p><b>Usage of self-adhesive resin cement:</b> No adhesive application.</p>	<p><b>STEP 1</b> Rinse and dry.</p> <p><b>STEP 2</b> <b>Usage of adhesive resin cement:</b> Apply GLUMA Bond Universal, rub in for 20 sec., air dry and light cure for 10 sec.</p> <p><b>Usage of self-adhesive resin cement:</b> No adhesive application.</p>

	Repairing veneered zirconia ceramics	Repairing composite	Repairing feldspathic ceramics	Repairing lithium disilicate restorations	Repairing porcelain fused metal crowns
MATERIAL SIDE	<p><b>STEP 1</b> Roughen the surface for repairing with a fine diamond bur or sandblast <b>Tip:</b> Never use phosphoric acid on Zirconia surfaces</p> <p><b>STEP 2</b> Apply GLUMA Ceramic Primer for 20 sec. on veneering ceramic, air dry</p> <p><b>STEP 3</b> Apply GLUMA Bond Universal, rub in for 20 sec., air dry and light cure for 10 sec.</p> <p><b>STEP 4</b> Apply Charisma Topaz or Charisma Diamond</p>	<p><b>STEP 1</b> Roughen the surface for repairing with a fine diamond bur</p> <p><b>STEP 2</b> Optional: Apply GLUMA Ceramic Primer for 20 sec. for higher bond strength, air dry</p> <p><b>STEP 3</b> Apply GLUMA Bond Universal, rub in for 20 sec., dry and polymerize for 10 sec.</p> <p><b>STEP 4</b> Apply Charisma Topaz or Charisma Diamond</p>	<p><b>STEP 1</b> Roughen the surface for repairing with a fine diamond bur or sandblast</p> <p><b>STEP 2</b> Apply GLUMA Ceramic Primer for 20 sec. on the veneering ceramic, air dry</p> <p><b>STEP 3</b> Apply GLUMA Bond Universal, rub in for 20 sec., dry and polymerize for 10 sec.</p> <p><b>STEP 4</b> Apply Charisma Topaz or Charisma Diamond</p>	<p><b>STEP 1</b> Roughen the surface for repairing with a fine diamond bur or sandblast</p> <p><b>STEP 2</b> Apply GLUMA Ceramic Primer for 20 sec., air dry</p> <p><b>STEP 3</b> Apply GLUMA Bond Universal, rub in for 20 sec., dry and polymerize for 10 sec.</p> <p><b>STEP 4</b> Apply Charisma Topaz or Charisma Diamond</p>	<p><b>STEP 1</b> Roughen the surface for repairing with a fine diamond bur <b>Tip:</b> Never use phosphoric acid on metal surfaces</p> <p><b>STEP 2</b> Apply GLUMA Ceramic Primer for 20 sec. on veneering ceramic, air dry</p> <p><b>STEP 3</b> Apply GLUMA Bond Universal, rub in for 20 sec., dry and polymerize for 10 sec.</p> <p><b>STEP 4</b> Apply Charisma Opal Flow Baseline to mask the metal, light cure for 20 sec.</p> <p><b>STEP 5</b> Apply Charisma Topaz or Charisma Diamond</p>

	Isolate tooth (e.g. rubber dam)
TTOOTH SIDE	<p>If repair is in direct contact with tooth surface:</p> <p><b>STEP 1</b> Etch enamel with phosphoric acid for 20–30 sec. <b>Tip:</b> Keep away phosphoric acid from adjacent metal and zirconia surfaces which need repair!</p> <p><b>STEP 2</b> Rinse and dry</p> <p><b>STEP 3</b> Apply GLUMA Bond Universal, rub in for 20 sec., air dry and light cure for 10 sec.</p> <p><b>STEP 4</b> Apply Charisma Topaz, Charisma Diamond or Charisma Opal Flow</p>

## 1 Direct restoration using the self-etch technique



Prepare the cavity and finish with fine diamond bur.

Apply GLUMA Bond Universal using a microbrush on the moist cavity surface.

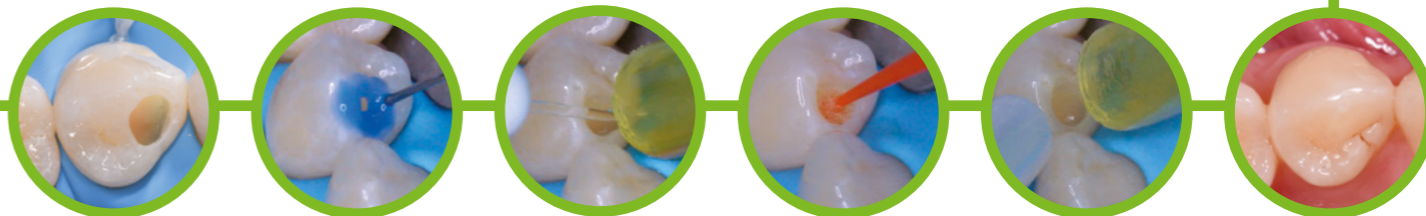
Brush actively GLUMA Bond Universal for 20sec over the dentine moving towards the enamel.

Apply the adhesive also on the enamel for a proper infiltration.

Air dry until the adhesive layer does not move any more to evaporate completely water and the solvent.

Light cure the adhesive for 10sec. Place the curing tip as close as possible over the cavity. Proceed with the composite restoration.

## 2 Direct restoration using the selective enamel etch technique



Preparing of the cavity. A selective enamel approach was taken due to the very deep cavity.

Selective enamel conditioning: Etch the enamel with phosphoric acid for 20–30 sec.

Rinse for at least 10 seconds and dry. Avoid over-drying. Dentine should be moist.

Apply GLUMA Bond Universal to enamel and dentine and rub in for 20sec.

Dry until the adhesive film does not move anymore. Light cure for 10sec.

Fill the cavity with Charisma Topaz .  
**Tip:** It is advisable to first apply at least 0.5mm of flowable composite (e.g. Charisma Opal Flow) to the dentine and light cure for 20sec.

Direct restoration using the self-etch technique

**STEP 1**  
Apply GLUMA Bond Universal

**STEP 2**  
Air dry and light cure

**STEP 3**  
Apply Charisma Topaz,  
Charisma Diamond or  
Charisma Opal Flow

Direct restoration using the selective enamel etch technique

**STEP 1**  
Apply phosphoric acid:  
Enamel only

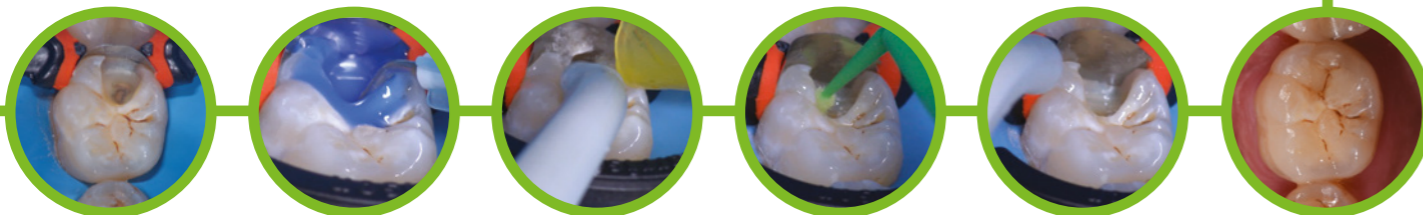
**STEP 2**  
Rinse and dry

**STEP 3**  
Apply GLUMA Bond  
Universal

**STEP 4**  
Air dry and light cure

**STEP 5**  
Build up  
Charisma Topaz or  
Charisma Diamond

### 3 Direct restoration using the etch and rinse technique



Preparing of the cavity. An etch&rins approach was taken due to the very small and deep cavity.

Etch&rins: Apply phosphoric acid starting from the enamel for 20–30 sec, then extend into the dentine for 15sec.

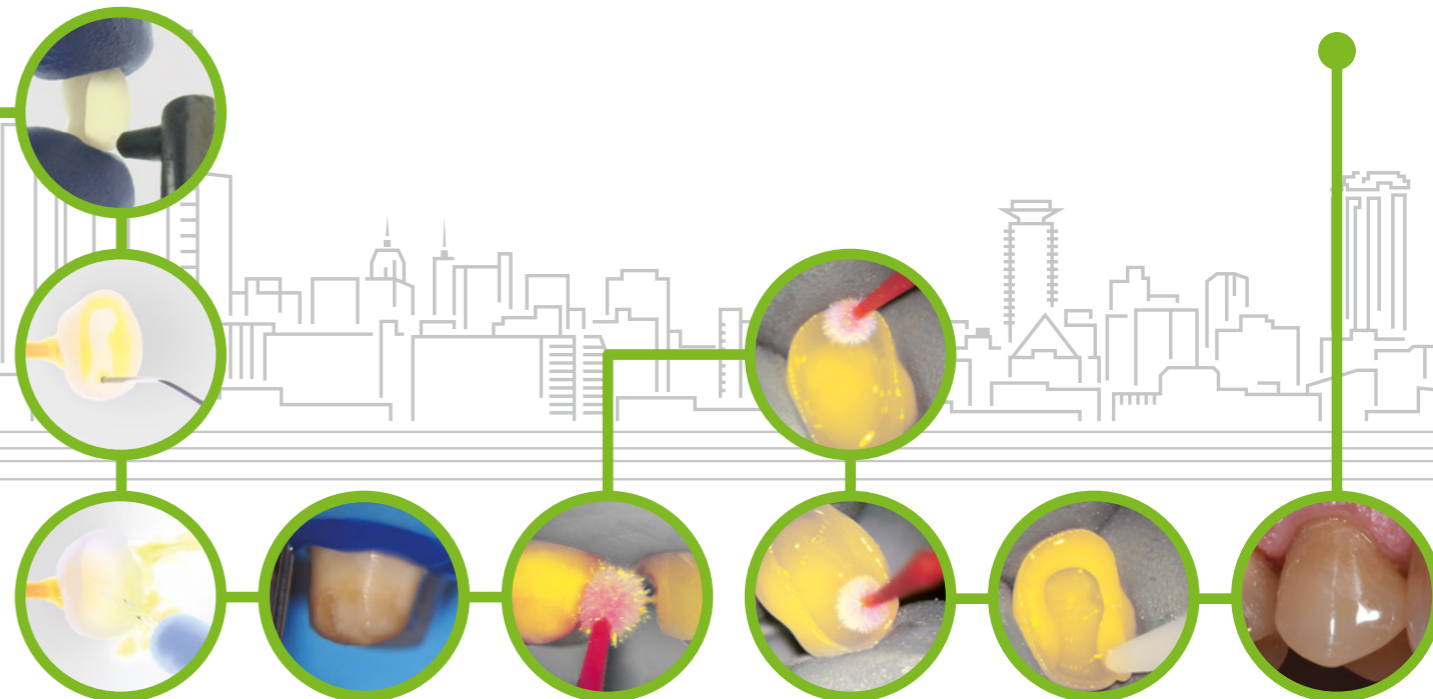
Rinse the cavity with plenty of water for 20 seconds and dry gently. Avoid over-drying. Dentine should be moist.

Rub GLUMA Bond Universal into the enamel and dentine for 20sec.

Air dry until the adhesive film is stable and light cure for 10 seconds.

Fill the cavity with Charisma Topaz .  
**Tip:** Apply at least 0.5mm of flowable (e.g. Charisma Opal Flow) to the dentine and light cure before the application of the pasty composite.

### 4 Adhesive cementation of lithium disilicate crowns



After trial placement, etch the inner surface of the crown with 5% hydrofluoric acid for 20sec. Clean in an ultrasonic unit for 5 min.

After placing rubber dam, etch selectively the enamel with phosphoric acid for 20–30sec. Rinse and dry. Avoid over-drying. Dentine should be moist.

Rub in GLUMA Bond Universal for 20sec. Air dry until the adhesive film does not move anymore and light cure for 10sec.

Apply GLUMA Ceramic Primer to the crown and allow to evaporate for 20sec followed by air drying. Rub in GLUMA Bond Universal for 20sec. Air dry until the adhesive film does not move any longer. Light cure for 10sec.

Apply a dual-curing cement into the crown.  
**Tip:** If cementing an adhesive overlay and a sufficient light permeability through the restoration is ensured: a light-curing pre-heated composite or flowable can be used alternatively.

After placing the crown, remove excess cement. Apply an air-blocking gel and light cure each aspect of the tooth sufficiently.

Direct restoration using the etch & rinse technique

STEP 1

Apply phosphoric acid to enamel and dentine

STEP 2

Rinse and dry

STEP 3

Apply GLUMA Bond Universal

STEP 4

Air dry and light cure

STEP 5

Build up Charisma Topaz or Charisma Diamond

MATERIAL

TOOTH

Adhesive cementation of lithium disilicate crowns

STEP 1

Etch with hydrofluoric acid for 20 sec

STEP 2

Apply GLUMA Ceramic Primer

STEP 3

Apply GLUMA Bond Universal, air dry and light cure

STEP 4

Dual-curing cement or light curing pre-heated composite

STEP 1

Apply phosphoric acid, enamel only

STEP 2

Rinse and dry

STEP 3

Apply GLUMA Bond Universal

STEP 4

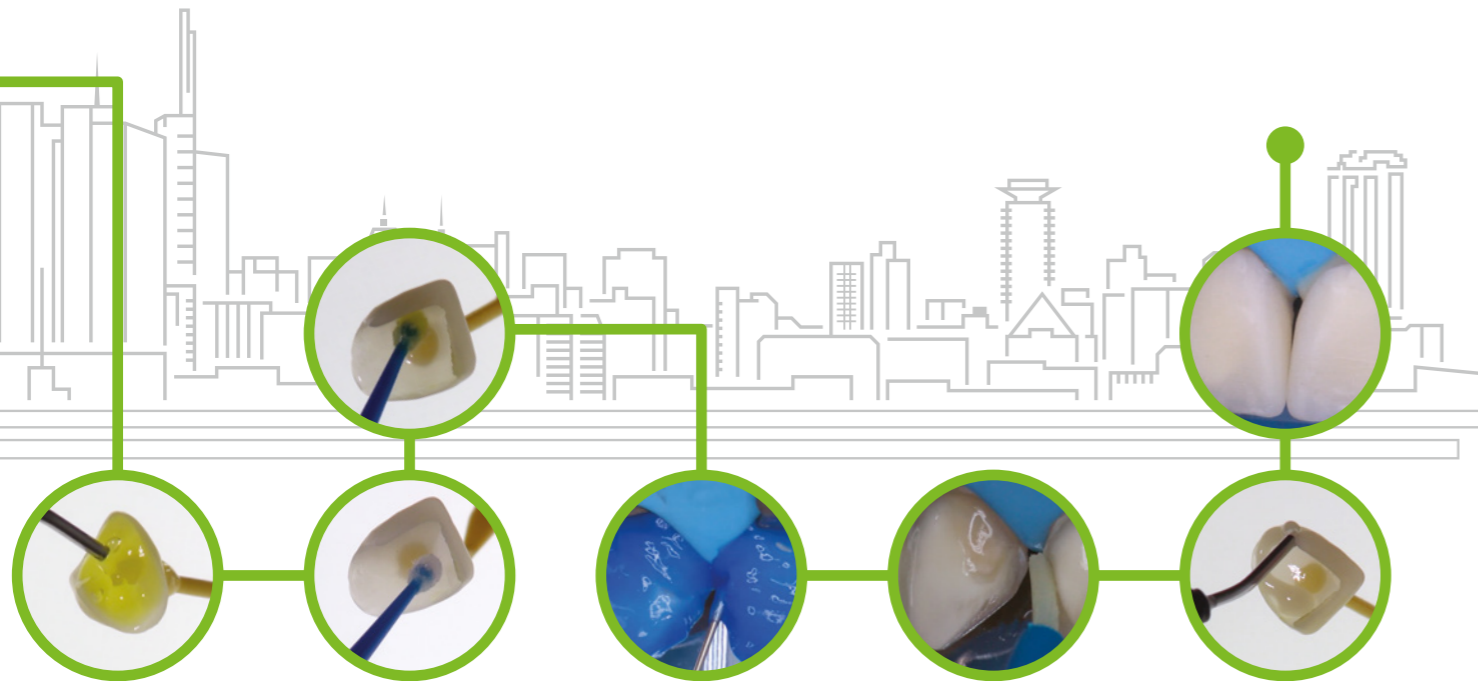
Air dry

STEP 5

Light cure



## 5 Adhesive cementation of lithium disilicate and glass-ceramic veneers



After trial placement, etch the inner surface of the veneer with hydrofluoric acid (check instructions for use of ceramic manufacturer regarding time and concentration of the hydrofluoric acid). Clean in an ultrasonic unit for 5 min.

Apply GLUMA Ceramic Primer to the veneer and allow it to evaporate for 20sec, air dry. Rub in GLUMA Bond Universal for 20sec. Dry until adhesive layer does not move any longer and light cure for 10sec.

After placing the rubber dam and cleaning the preparation, etch the enamel with phosphoric acid for 20–30 sec and any exposed dentine for 15sec. Rinse and dry. Avoid over-drying. Dentine should be moist.

Rub in GLUMA Bond Universal for 20sec. and air dry until the adhesive film does not move any longer. Light cure for 10sec.

Apply a light-curing cement, a flowable or a pre-heated composite. Remove any excess material. Apply an air-blocking gel and light cure all margins of the tooth sufficiently.

### MATERIAL

### TOOTH

Adhesive cementation of lithium disilicate and glass-ceramic veneers

**STEP 1**  
Etch with hydrofluoric acid for 20 sec

**STEP 2**  
Apply GLUMA Ceramic Primer

**STEP 3**  
Apply GLUMA Bond Universal, air dry and light cure

**STEP 4**  
Warm composite or dual cement

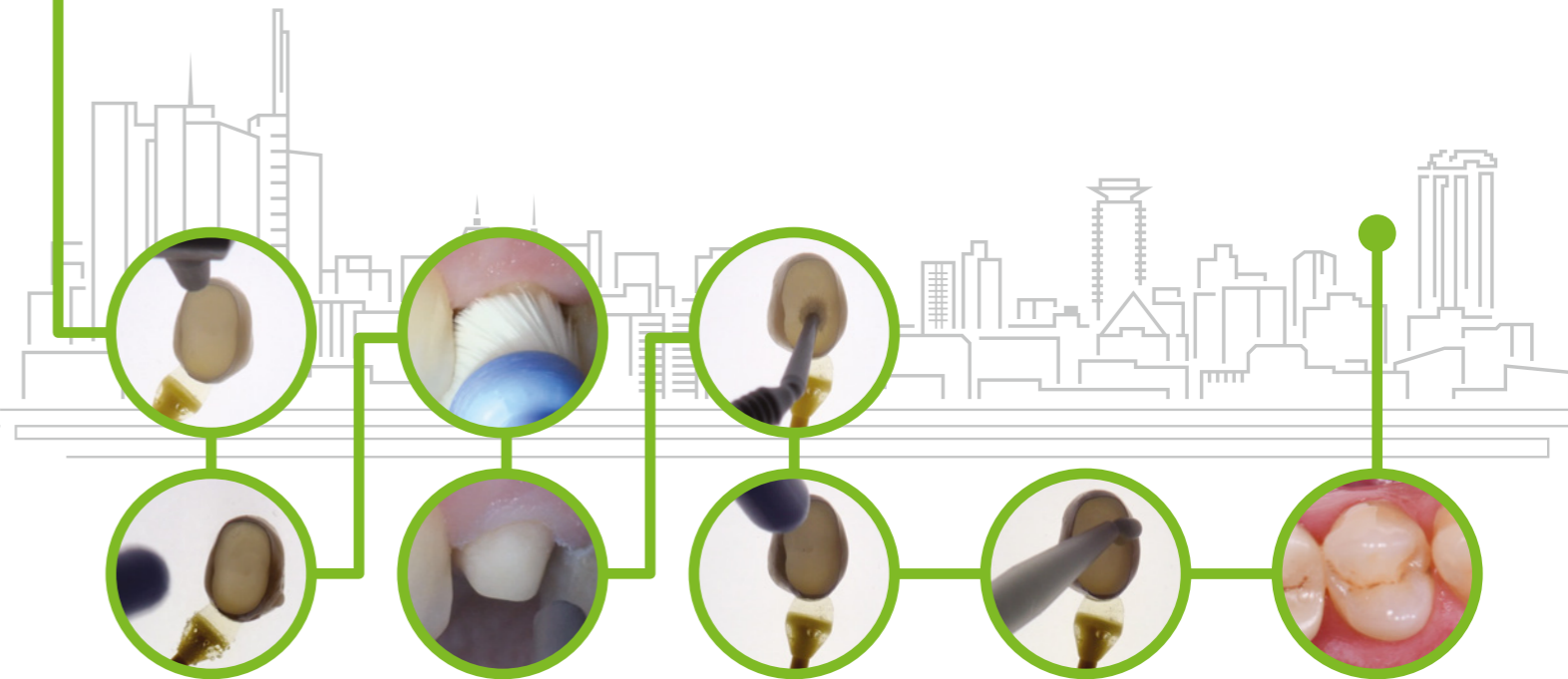
**STEP 1**  
Phosphoric acid, enamel only

**STEP 2**  
Rinse and dry

**STEP 3**  
Apply GLUMA Bond Universal

**STEP 4**  
Air dry and light cure

## 6 Adhesive cementation of zirconia crowns



After trial placement, sandblast the inner surface of the crown according to the recommendations of the restoration material manufacturer.

Clean the tooth with a brush polisher and air-abrade the prepared tooth with glycine powder.

Rub GLUMA Bond Universal into the inner surface of the crown for 20 sec, air dry until the adhesive film does not move anymore and light cure for 10 sec.

Apply a dual-curing self-adhesive resin cement into the crown. Alternatively, a dual-curing adhesive resin cement can be used. In this case GLUMA Bond Universal needs also be applied on the tooth.

Place the crown and remove the excess cement. Apply an air-blocking gel and light cure all margins of the tooth sufficiently.

### MATERIAL

### TOOTH

Adhesive cementation of zirconia crowns

**STEP 1**  
Sandblast

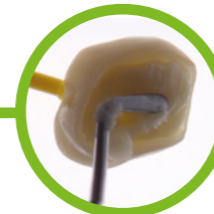
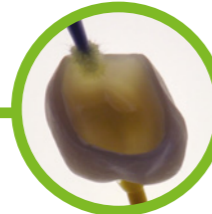
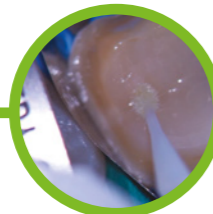
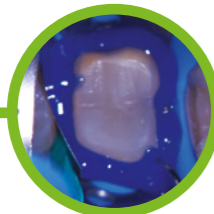
**STEP 2**  
Apply GLUMA Bond Universal, air dry and light cure

**STEP 3**  
Apply dual curing self-adhesive or adhesive resin cement

**STEP 1**  
Clean the preparation

**STEP 2**  
Apply GLUMA Bond Universal if no self-adhesive resin cement is used

## 7 Adhesive cementation of hybrid ceramics (composite)



Sandblast the inner surface of the crown using aluminum oxide. Check the instruction for use of the hybrid ceramic manufacturer. Clean the restoration surface using phosphoric acid for 10sec. and rinse with water.

After placing the rubber dam and cleaning the preparation by a brush polisher, etch the enamel with phosphoric acid for 20–30 sec and any exposed dentine for 15sec. Rinse and dry. Avoid over-drying. Dentine should be moist.

Rub in GLUMA Bond Universal for 20sec and air dry until the adhesive film does not move any longer. Light cure for 10sec.

Apply GLUMA Ceramic Primer (optional) to the inner surface of the overlay, allow it to evaporate for 20sec before rubbing in GLUMA Bond Universal for 20sec. Dry until the adhesive film does not move any longer. Light cure for 10sec.

Apply a portion of composite (warmed to 54 °C for 5 min) to the inner surface of the overlay. Alternatively, also a flowable or dual-curing adhesive resin cement could be used.

After placing the overlay, remove any excess carefully. Apply an air-blocking gel and light cure sufficiently from all aspects.

### MATERIAL

### TOOTH

Adhesive cementation of hybrid ceramics (composite)

STEP 1  
Sandblast

STEP 2  
Rinse

STEP 3  
Apply GLUMA Ceramic Primer

STEP 4  
Apply GLUMA Bond Universal, air dry and light cure

STEP 5  
Warmed composite or flowable

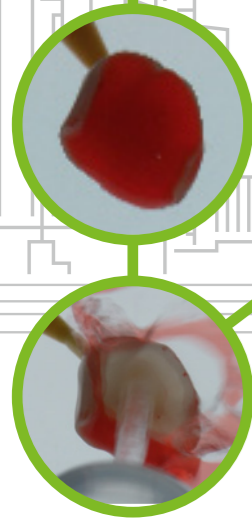
STEP 1  
Apply phosphoric acid, enamel and dentine

STEP 2  
Rinse and dry

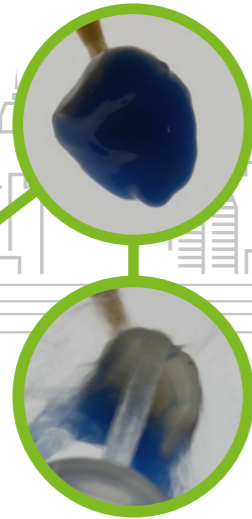
STEP 3  
Apply GLUMA Bond Universal

STEP 4  
Air dry and light cure

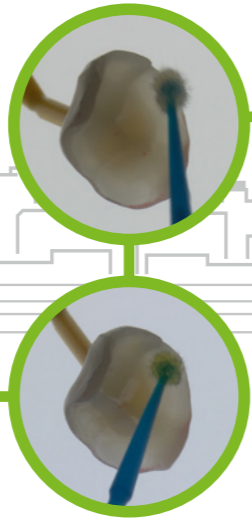
## 8 Adhesive cementation of polymer infiltrated ceramics (e.g. Vita Enamic)



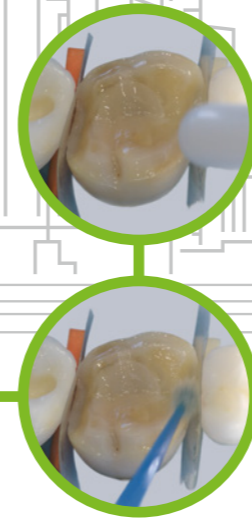
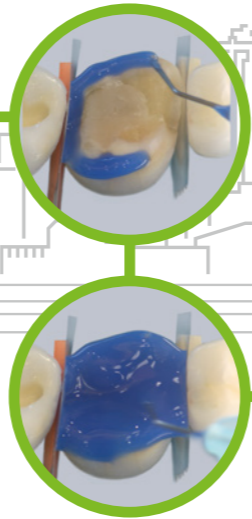
After trial placement, etch the inner surface of the restoration with 5% hydrofluoric acid for 60sec\* followed by a thorough water rinsing. Afterwards, the restoration can be additionally cleaned using phosphoric acid for 30sec and water rinsing.



Apply GLUMA Ceramic Primer to dry the inner surface of the restoration and allow it to evaporate for 20sec, air dry. Rub in GLUMA Bond Universal for 20sec. Dry until adhesive layer does not move any longer and light cure for 10sec.



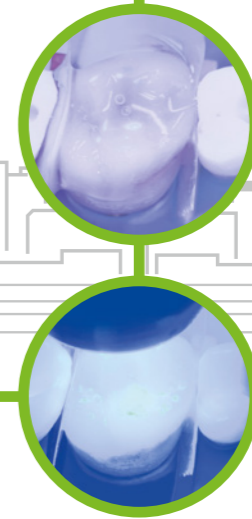
After placing the rubber dam and cleaning of the preparation, etch the enamel with phosphoric acid for 20–30sec and any exposed dentine for 15sec. Rinse and dry. Avoid over-drying. Dentine should be moist.



Rub in GLUMA Bond Universal for 20sec. and air dry until the adhesive film does not move any longer. Light cure for 10sec.



If a sufficient light transmission through the restoration is ensured, a light curing flowable can be used for cementation. Apply the flowable directly on the restoration contact surface of the tooth. Place the restoration onto the tooth and remove the excess luting material. In case a sufficient light penetration through the restoration is not certain, use a dual-curing adhesive resin cement.



Light cure all margins of the tooth sufficiently (if no further information from the luting material manufacturer is provided: cure for 1 min/side). Apply an air-blocking gel and repeat light curing. Cool down tooth during light curing by air-stream or placing the saliva ejector close to the tooth.

\* Conejo J *et al.*: Effect of surface treatment and cleaning on the bond strength to polymer-infiltrated ceramic network CAD-CAM material. J Prosthet Dent, Published online October 27, 2020: <https://doi.org/10.1016/j.prosdent.2020.08.016>

### MATERIAL

#### STEP 1

Etch with hydrofluoric acid

#### STEP 2

Apply GLUMA Ceramic Primer

#### STEP 3

Apply GLUMA Bond Universal, air dry and light cure

#### STEP 1

Apply phosphoric acid on enamel and dentine

#### STEP 2

Rinse and dry

#### STEP 3

Apply GLUMA Bond Universal

#### STEP 4

Air dry and light cure

#### STEP 5

Place flowable composite

Adhesive cementation of polymer infiltrated ceramics



## 9 Repair of veneered zirconia restoration



Mesio-incisal chipping of a zirconia crown on tooth 41.

Roughen the damaged ceramic surface with a fine diamond bur (40µm) or sandblast to enhance retention.

If zirconia is veneered by feldspatic ceramics use: Apply GLUMA Ceramic Primer on the surface of the veneering material and allow it to evaporate for 20sec. Air dry.

Rub GLUMA Bond Universal on the fractured ceramic surface for 20sec. Air dry until the adhesive film does not move any longer and light cure for 10sec.

Apply the corresponding Charisma Topaz or Charisma Diamond composite shade. Light cure, polish and finish.

Completed ceramic repair examined 1 week later.

Repair of veneered zirconia restoration

### STEP 1

Roughen the surface to be repaired with a diamond bur

### STEP 2

Apply GLUMA Ceramic Primer

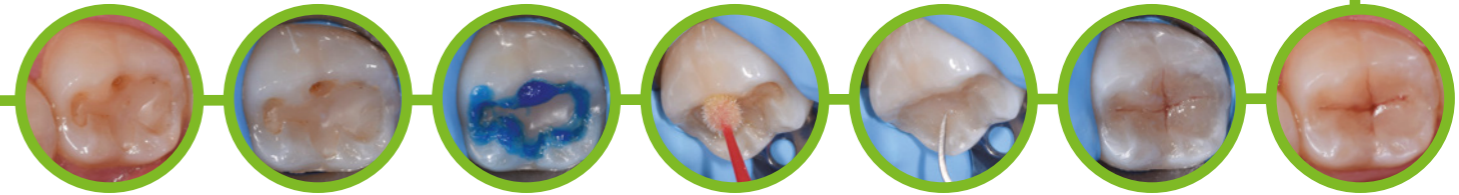
### STEP 3

Apply GLUMA Bond Universal, air dry and light cure

### STEP 4

Apply Charisma Topaz

## 10 Repair of composite restoration



Secondary caries on the vestibulo-occlusal aspect of a composite restoration on tooth 47.

Isolation of the operating site by rubber dam.

After caries excavation and cavity preparation, apply phosphoric acid gel (GLUMA Bond Etch) to etch the cavity.

Rub GLUMA Bond Universal into the cavity and enamel margins for 20sec. Air dry until the adhesive film does not move any longer and light cure for 10sec.

Apply the corresponding Charisma Opal Flow shade in a 0.5mm layer and build up increments of Charisma Topaz or Charisma Diamond composite shade. Light cure each composite layer.

Completed composite repair with partial restoration of the occlusal anatomy before removing the rubber dam.

Composite restoration repaired on tooth 47 after one week.

Repair of composite restoration

### STEP 1

Etch the enamel and dentine with phosphoric acid

### STEP 2

Apply GLUMA Bond Universal, air dry and light cure

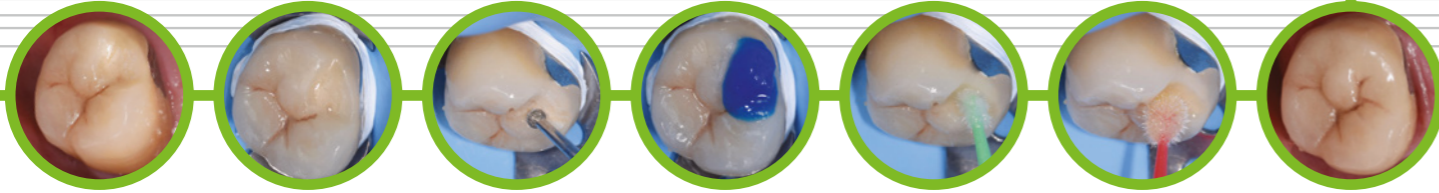
### STEP 3

Apply Charisma Opal Flow

### STEP 4

Build up with Charisma Topaz /Charisma Diamond

## 11 Repair of feldspatic ceramic veneering without exposure of the metal framework



Partial mesial chipping of a metal-ceramic crown on tooth 17. The metal framework is not exposed.

Isolation of the operating site with rubber dam and Teflon foil.

Roughening the damaged surface of the ceramic with a fine diamond bur in order to create micro-roughness for enhancing retention of the adhesive on the ceramic surface.

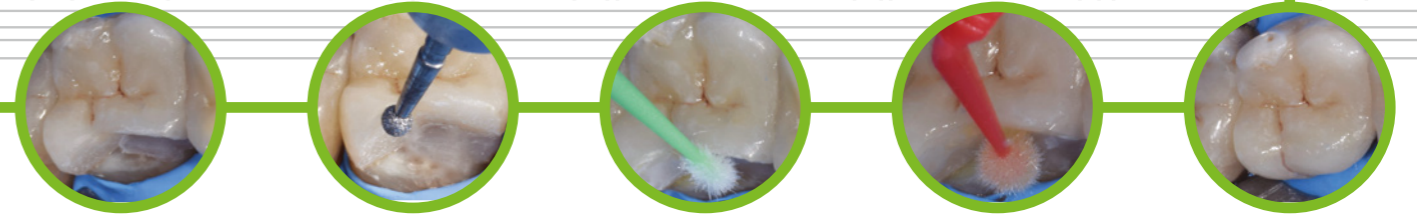
Application of a phosphoric acid gel (GLUMA Etch) to clean the surface roughened by the diamond bur.  
**Tip:** Do not clean the restoration with phosphoric acid gel if metal is exposed.

Rinse, apply GLUMA Ceramic Primer on the fractured restoration surface and allow to evaporate for 20sec.

Rub GLUMA Bond Universal into the surface being repaired for 20sec. Air dry until the adhesive film does not move any longer and light cure for 10sec.

Apply the corresponding Charisma Topaz composite and light cure before polishing and finishing. Once the ceramic has been repaired, the rubber dam can be removed.

## 12 Repair of lithium disilicate restoration



Complications arose after 3 years of clinical use. The fracture in the palatal wall of 16 is clearly visible after being isolated with a rubber dam.

Roughening the surface being repaired – both the partial lithium disilicate restoration and the underlying dentine – using a fine diamond bur or sandblast. At the same time, etch the exposed dentine with phosphoric acid for 15sec.

Apply GLUMA Ceramic Primer on the fractured ceramic surface and allow to evaporate for 10sec. Air dry.

Rub GLUMA Bond Universal into the surface being repaired and into the exposed dentine for 20sec. Air dry until the adhesive film does not move any longer and light cure for 10sec.

Build up 3 increments – polymerize each separately – of the corresponding Charisma Topaz or Charisma Diamond shade to reconstruct the fractured palatal area of 16, followed by finishing and polishing. Complete repairing the palatal wall by rebuilding the anatomy of the mesio-palatal and disto-palatal cusps of 16. Light cure each increment individually.

Repair of feldspatic ceramic veneering without exposure of the metal framework

STEP 1

Roughen the surface being repaired with a diamond bur

STEP 2

Clean the surface being repaired with phosphoric acid

STEP 3

Apply GLUMA Ceramic Primer

STEP 4

Apply GLUMA Bond Universal air dry, light cure

STEP 5

Apply Charisma Topaz or Charisma Diamond

Repair of lithium disilicate restoration

STEP 1

Roughen the surface being repaired with a diamond bur

STEP 2

Etch dentine with phosphoric acid

STEP 3

Apply GLUMA Ceramic Primer

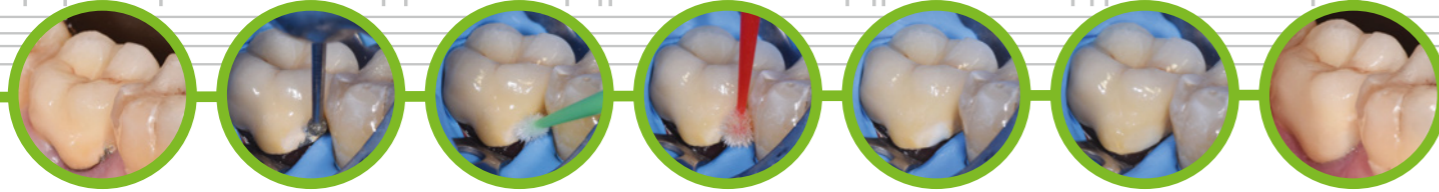
STEP 4

Apply GLUMA Bond Universal, air dry and light cure

STEP 5

Apply Charisma Topaz or Charisma Diamond

## 13 Repair of porcelain fused metal crown with exposed metal framework



Mesial and cervical partial fracture of the feldspathic ceramic veneering with exposure of the metal framework of crown tooth 4.7.

Roughening the ceramic surface with a fine diamond bur to create micro-roughness on the surface for enhanced retention.

Apply GLUMA Ceramic Primer on the ceramic and allow it to evaporate for 20sec. Air dry.

Rub GLUMA Bond Universal into the surface being repaired for 20sec. Air dry until the adhesive film does not move any longer and light cure for 10sec.

**Tip:** Use GLUMA Bond Universal in the self-etch mode in these situation. Never use phosphoric acid on metal surfaces.

Apply a thin layer of milk-white flowable composite (Charisma Opal Flow Baseline) to mask the metal coping and prevent it being visible beneath the composite resin repair. Light cure.

Complete the repair of the fractured ceramic margin by applying a layer of the corresponding Charisma Topaz or Charisma Diamond composite shade followed by light-curing, finishing and polishing.

Evaluate the repaired margin tooth 47. The periodontal tissues have been repositioned following displacement by the Teflon sheet and rubber dam clamp.

Repair of porcelain fused metal crown with exposed metal framework

### STEP 1

Roughen the surface being repaired with a diamond bur

### STEP 2

Apply GLUMA Ceramic Primer

### STEP 3

Apply GLUMA Bond Universal air dry, light cure

### STEP 4

Apply Charisma Diamond Flow Baseline

### STEP 5

Apply Charisma Topaz or Charisma Diamond



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