# i Bond Journey







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

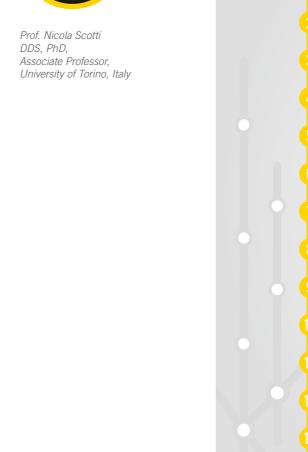
Adhesive dentistry is growing steadily due to the need for increasingly minimally invasive treatment. Compromised tissue, typically due to adhesive preparations has resulted in a slow transition from direct and indirect macro-retentive restorations to micro-retentive restorations. This transition is 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 iBOND Universal correctly in different situations: direct restorations, cementation of indirect restorations and repairs on different substrates.







Direct restoration using the self-etch technique

Direct restoration using the selective enamel etch technique

Direct restoration using etch&rinse technique

Adhesive cementation of lithium disilicate crowns

Adhesive cementation of lithium disilicate and glass-ceramic veneers

Adhesive cementation of zirconia crowns

Adhesive cementation of hybrid ceramics (composite)

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

Repair of veneered zirconia restoration

Repair of composite restoration

Repair of feldspatic ceramic veneering without exposure of the metal framework

Repair of lithium disilicate restoration

Repair of porcelain fused metal crown with exposed metal framework



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

	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				Check instruction for use of the ceramic manufacturer.  STEP 2  Etch with hydrofluoric acid. Rinse thoroughly with water.  Tip: Ultrasonic cleaner for 5 minutes.  STEP 3  Apply iBOND  Ceramic Primer and allow to evaporate for 20 sec., air dry  STEP 4  Apply iBOND  Universal, rub in for 20 sec., air dry and light cure for 10 sec.  STEP 5  Apply dual-curing adhesive resin cement	STEP 1 Check instruction for use of the ceramic manufacturer. STEP 2 Etch with hydrofluoric acid. Rinse thoroughly with water. Tip: Ultrasonic cleaner for 5 minutes. STEP 3 Apply iBOND Ceramic Primer and allow to evaporate for 20 sec., air dry STEP 4 Apply iBOND Universal, rub in for 20 sec., air dry and light cure for 10 sec. STEP 5 Apply dual-curing adhesive resin cement	Check instruction for use of the ceramic manufacturer.  STEP 2  Sandblasting. Rinse thoroughly with water.  Tip: Never use phosphoric acid on zirconia and metal surfaces  STEP 3  Apply iBOND  Universal, rub in for 20 sec., air dry and polymerize for 10 sec.  STEP 3  Apply dual-curing self-adhesive resin cement or dual-curing adhesive resin cement	Check instruction for use of the ceramic manufacturer regarding surface pre-treatment: Sandblasting. Rinse throroughly with water.  STEP 2  Optional: Apply iBOND Ceramic Primer for 20 sec., air dry  STEP 3  Apply iBOND  Universal, rub in for 20 sec., air dry and polymerize for 10 sec.  STEP 4  Apply flowable or pre-heated composite (alternatively: dual-curing self-adhesive resin cement)	Check instruction for use of the ceramic manufacturer regarding surface pretreatment: polymer infiltrated ceramics require hydrofluoric acid etching STEP 2  Apply iBOND  Ceramic Primer for 20 sec., air dry.  STEP 3  Apply iBOND  Universal, rub in for 20 sec., air dry and polymerize for 10 sec.  STEP 4  Apply flowable or pre-heated composite (alternatively: dual-curing self-adhesive resin cement or dual-curing adhesive resin cement)			
		Isolate tooth (e.g. rubber dam)									
TOOTH SIDE	Apply iBOND Universal, rub in for 20 sec., air dry and light cure for 10 sec. SIEP 2 Apply Venus Pearl, Venus Diamond Flow Venus Diamond Flow	Etch enamel with phosphoric acid for 20 – 30 sec.  SIPP 2  Rinse and dry  SIPP 3  Apply iBOND  Universal, rub in for 20 sec., air dry and light cure for 10 sec.  SIRP 3  Apply Venus Pearl, Venus Diamond or Venus Diamond Flow	Etch enamel with phosphoric acid for 20–30 sec. and the dentine for 15 sec.  STEP 2  Rinse and dry  STEP 3  Apply iBOND  Universal, rub in for 20 sec., air dry and light cure for 10 sec.  STEP 4  Apply Venus Pearl, Venus Diamond or Venus Diamond Flow	Etch enamel with phosphoric acid for 20 – 30 sec. and the dentine for 15 sec.  SIEP 2  Rinse and dry  SIEP 3  Apply iBOND  Universal, rub in for 20 sec., air dry and light cure for 10 sec.	Etch enamel with phosphoric acid for 20 – 30 sec. and the dentine for 15 sec.  SIEP 2  Rinse and dry  SIEP 3  Apply iBOND  Universal, rub in for 20 sec., air dry and light cure for 10 sec.	Rinse and dry.  VILP 2  Usage of adhesive resin cement: Apply iBOND Universal, rub in for 20 sec., air dry and light cure for 10 sec.  Usage of self-adhesive resin cement:  No adhesive application.	Rinse and dry.  SILP 2  Usage of adhesive resin cement: Apply iBOND Universal, rub in for 20 sec., air dry and light cure for 10 sec.  Usage of self-adhesive resin cement:  No adhesive application.	Rinse and dry.  SILP 2  Usage of adhesive resin cement: Apply iBOND Universal, rub in for 20 sec., air dry and light cure for 10 sec.  Usage of self-adhe- sive resin cement: No adhesive application.			

	Repairing veneered zirconia ceramics	Repairing composite	Repairing feldspathic ceramics	Repairing lithium disilicate restorations	Repairing porcelain fused metal crowns				
MATERIAL SIDE		STEP 1  Roughen the surface for repairing with a fine diamond bur STEP 2  Optional: Apply iBOND Ceramic Primer for 20 sec. for higher bond strength, air dry STEP 3  Apply iBOND Universal, rub in for 20 sec., dry and polymerize for 10 sec. STEP 4  Apply Venus Pearl or Venus Diamond	STEP 1  Roughen the surface for repairing with a fine diamond bur or sandblast  STEP 2  Apply iBOND Ceramic Primer for 20 sec. on the veneering ceramic, air dry  STEP 3  Apply iBOND Universal, rub in for 20 sec., dry and polymerize for 10 sec.  STEP 4  Apply Venus Pearl or Venus Diamond						
	Isolate tooth (e.g. rubber dam)								

#### ....,

If renair is in direct contact with tooth surface

STEP 1

ch enamel with phosphoric acid for 20-30 sec.

Tip: Keep away phosphoric acid from adjacent metal and zirconia surfaces which need repair!

STEP 2

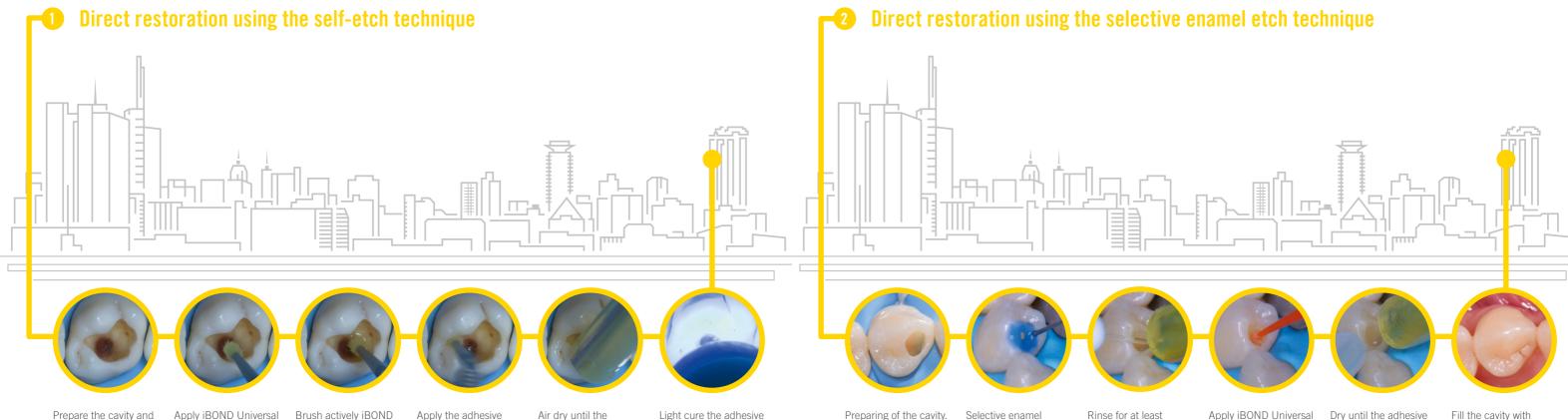
nse and dry

EP 3

ly ibund universal, rub in for 20 sec., air dry and light cure for 10 sec.

IEP 4

Apply Venus Pearl, Venus Diamond or Venus Diamond Flow



Prepare the cavity and finish with fine diamond using a microbrush on bur

Apply iBOND Universal the moist cavity surface.

Brush actively iBOND Universal for 20 sec towards the enamel.

Apply the adhesive also on the enamel for over the dentine moving a proper infiltration.

Air dry until the adhesive layer does not for 10 sec. Place the move any more to evaporate completely water and the solvent.

Proceed with the

curing tip as close as possible over the cavity. composite restoration.

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

Selective enamel conditioning: Etch the enamel with phosphoric Avoid over-drying. acid for 20-30 sec.

Rinse for at least 10 seconds and dry. Dentine should be moist.

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

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

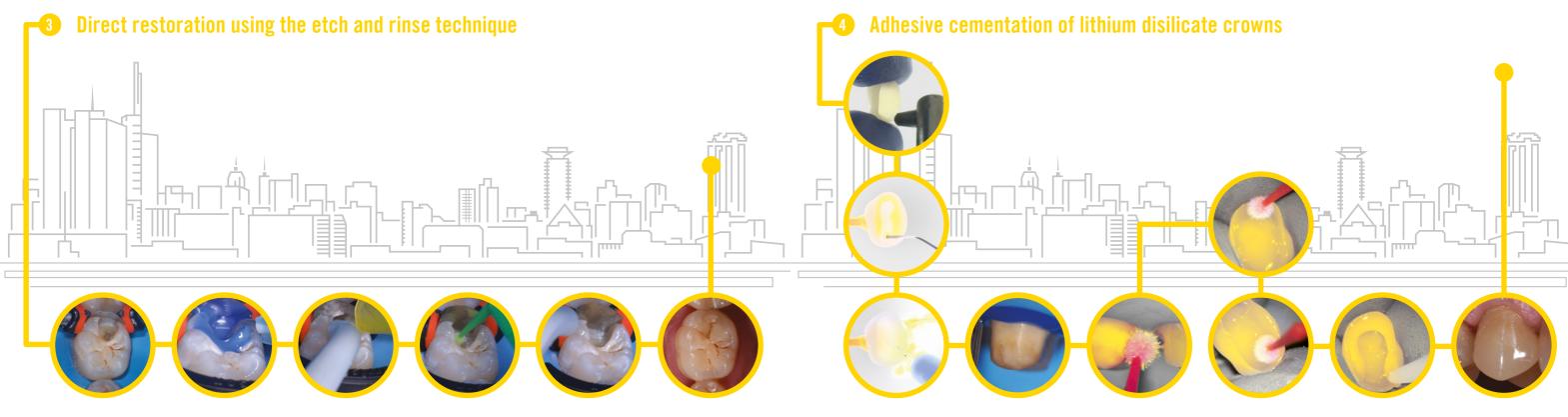
Fill the cavity with Venus Pearl.

Tip: It is advisable to first apply at least 0.5 mm of flowable composite (e.g. Venus Diamond Flow) to the dentine and light cure for 20 sec.

STEP 1

STEP 2

Rinse and dry



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

phosphoric acid starting from the enamel for 20-30 sec, then extend into the dentine for 15 sec.

Etch&rinse: Apply he moist

Rinse the cavity with plenty of water for 20 seconds and dry gently. Avoid overdrying. Dentine should Rub iBOND Universal into the enamel and dentine for 20 sec.

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

Fill the cavity with Venus Pearl.

Tip: Apply at least 0.5 mm of flowable (e.g. Venus Diamond Flow) to the dentine and light cure before the application of the pasty composite.

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

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

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

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

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.

TOOTH

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

Adhesive cementation crowns

STEP 2

Apply iBOND Ceramic Primer

STEP 3 Apply iBOND

STEP 4

STEP 1 Apply phosphoric acid, enamel only

STEP 2

Rinse and dry

STEP 4

STEP 5

Direct restoration using the etch & rinse technique

STEP 1 **Apply phosphoric** acid to enamel and dentine

STEP 2 Rinse and dry

STEP 3 Apply iBOND Universal STEP 4 Air dry and light cure

Build up Venus Pearl or **Venus Diamond** 

STEP 5

STEP 1

Etch with hydrofluorio acid for 20 sec

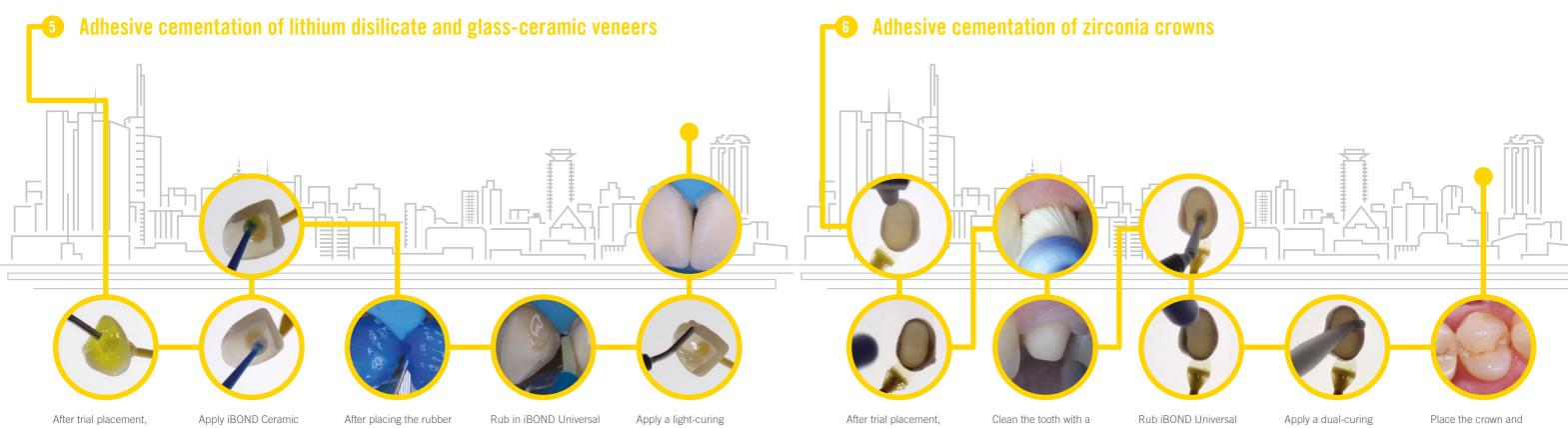
Universal, air dry and light cure

Dual-curing cement or light curing pre-heated

STEP 3 Apply iBOND Universal

Air dry

Light cure



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.

Adhesive cementation

of lithium disilicate and

glass-ceramic veneers

STEP 1

Etch with

acid for

20 sec

hydrofluoric

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

Primer

air dry and

light cure

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

or dual

cement

bber Rub in iBOND Universitie for 20 sec. and air dry until the adhesive film does not move any longer. Light cure for 10 sec.

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.

Universal

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 airabrade the prepared tooth with glycine powder.

Rub iBOND 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 iBOND 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.

TOOTH STEP 2 STEP 3 STEP 4 STEP 1 STEP 2 STEP 3 STEP 4 Apply iBOND Apply iBOND Apply iBOND Warmed Phosphoric Rinse and dry Air dry and Ceramic Universal. composite acid. light cure

enamel only

Adhesive cementation of zirconia crowns STEP 1 Sandblast STEP 2
Apply iBOND Universal, air dry and light cure

MATERIAL

STEP 3
Apply dua

Apply dual curing self-adhesive or adhesive resin cement

STEP 1

Clean the preparation

STEP 2

Apply iBOND Universal if no self-adhesive resin cement is used

# 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 10 sec. and rinse with water.

Adhesive cementation

of hybrid ceramics

(composite)



After placing the rubber Rub in iBOND Universal Apply iBOND Ceramic dam and cleaning the for 20 sec and air dry preparation by a brush until the adhesive film polisher, etch the enamel with phosphoric longer. Light cure for acid for 20-30 sec and 10 sec. any exposed dentine for 15 sec. Rinse and dry. Avoid over-drying. Dentine should be moist.



does not move any



Apply a portion of Primer (optional) to the composite (warmed to inner surface of the overlay, allow it to inner surface of the evaporate for 20 sec overlay. Alternatively, also a flowable or before rubbing in iBOND Universal for dual-curing adhesive



After placing the overlay, remove any 54°C for 5 min) to the excess carefully. Apply an air-blocking gel and light cure sufficiently from all aspects.

20 sec. Dry until the resin cement could be adhesive film does not used. move any longer. Light cure for 10 sec.

#### MATERIAL

STEP 1 Sandblast

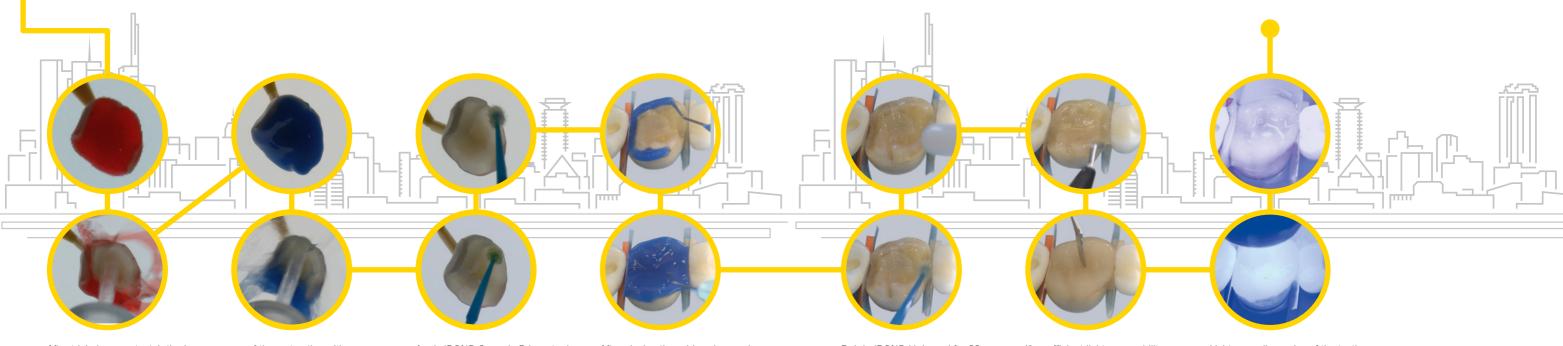
STEP 3

Apply iBOND Ceramic Primer

Air dry and

TOOTH STEP 4 STEP 5 STEP 1 STEP 2 STEP 3 STEP 4 Apply iBOND Apply Warmed Rinse and dry Apply iBOND Universal, composite phosphoric light cure air dry and or flowable acid, enamel Universal and dentine light cure

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



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

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

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

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

If a sufficient light permeability 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 polymerinfiltrated ceramic network CAD-CAM material, J Prosthet Dent. Published online October 27, 2020: https://doi.org/10.1016/j.prosdent.2020.08.016

STEP 1 Etch with hydrofluoric acid STEP 2 Apply iBOND Ceramic Primer

STEP 3

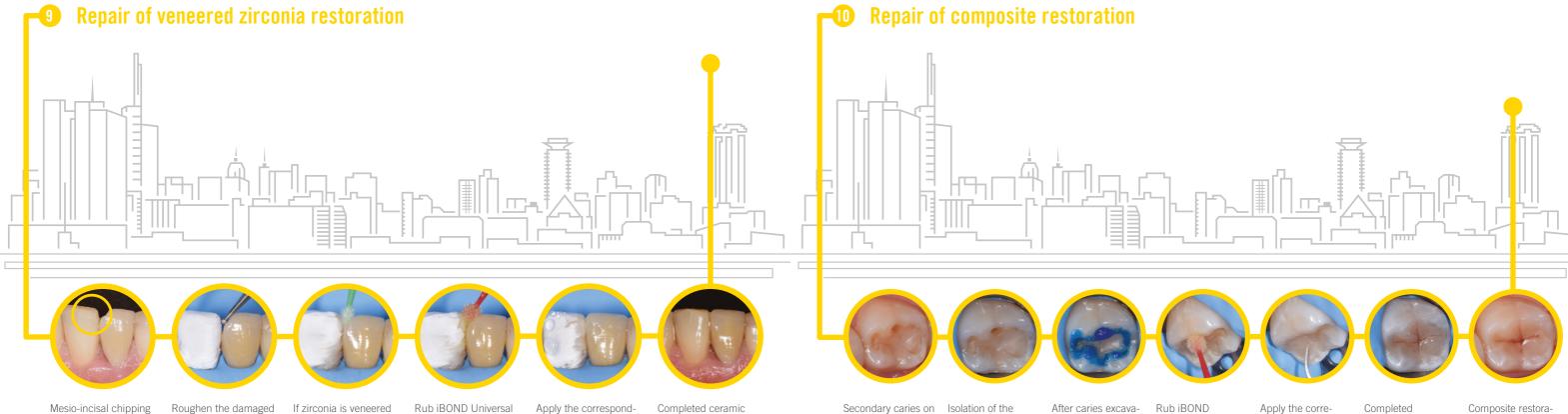
Apply iBOND Universal, air dry and light cure

STEP 1

STEP 2 Rinse and dry STEP 3

TOOTH

STEP 4 Air dry and light cure STEP 5 Place flowable composite



of a zirconia crown on tooth 41.

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

by feldspatic ceramics use: Apply iBOND material and allow it to move any longer and evaporate for 20 sec. Air light cure for 10 sec.

on the fractured ceramic surface for surface of the veneering adhesive film does not

ing Venus Pearl or Venus Diamond Ceramic Primer on the 20 sec. Air dry until the composite shade. Light cure, polish and finish.

repair examined 1 week later.

the vestibuloocclusal aspect of a rubber dam. composite restoration on tooth 47.

Repair of composite

restoration

operating site by

tion and cavity preparation, apply phosphoric acid gel (iBOND Etch) to etch the cavity.

Universal into the cavity and enamel margins for 20 sec. Air dry until the adhesive film does and light cure for

10 sec.

sponding Venus Diamond Flow shade in a 0.5 mm layer and build up increments of Venus not move any longer Pearl or Venus Diamond composite shade. Light cure each composite layer.

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

tion repaired on tooth 47 after one week.

STEP 1

Roughen the surface to be repaired with a diamond bur

STEP 2

Apply iBOND Ceramic Primer

STEP 3 Apply iBOND Universal, air dry and light cure

STEP 4 **Apply Venus Pearl** 

STEP 1

Etch the enamel and dentine with phosphoric acid

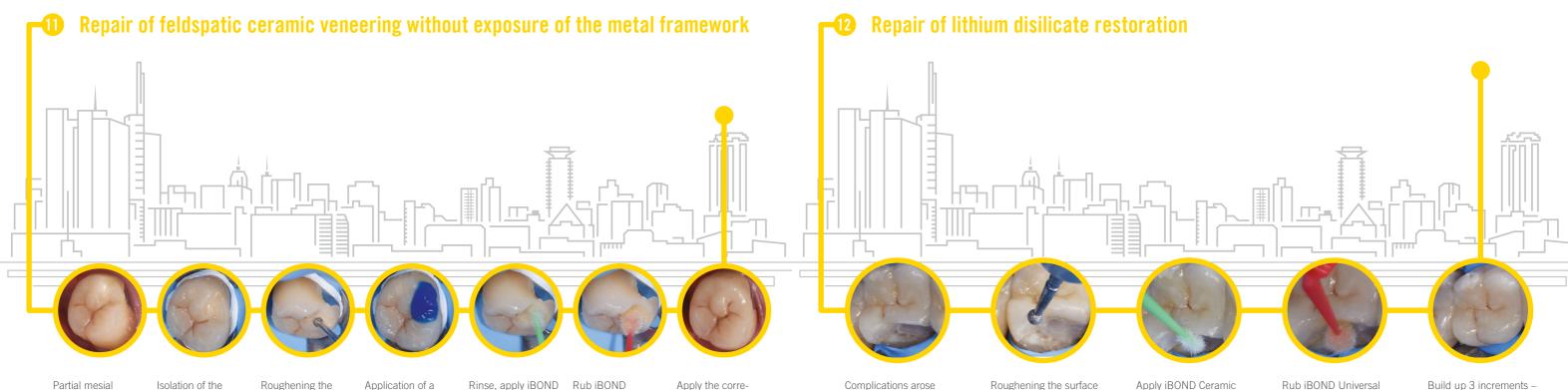
STEP 2

Apply iBOND Universal, air dry and light cure

STEP 3 **Apply Venus Diamond Flow**  STEP 4

Build up with Venus Pearl/ Venus Diamond

zirconia restoration



chipping of a metalceramic crown on tooth 17. The metal framework is not exposed.

operating site with rubber dam and Teflon foil.

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

phosphoric acid gel (iBOND Etch) to clean the surface roughened by the

Tip: Do not clean the restoration with phosphoric acid gel if metal is exposed.

Ceramic Primer on the fractured restoration surface and allow to evaporate for 20 sec.

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

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

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 15 sec.

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

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

polymerize each separately of the corresponding Venus Pearl or Venus 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 iBOND

**Ceramic Primer** 

Apply iBOND Universal air dry, light cure

STEP 4

STEP 5

**Apply Venus Pearl** or Venus Diamond

Repair of lithium

disilicate restoration

Roughen the surface being repaired with a diamond bur

STEP 1

STEP 2

Etch dentine with phosphoric acid

STEP 3 **Apply iBOND Ceramic** 

Primer

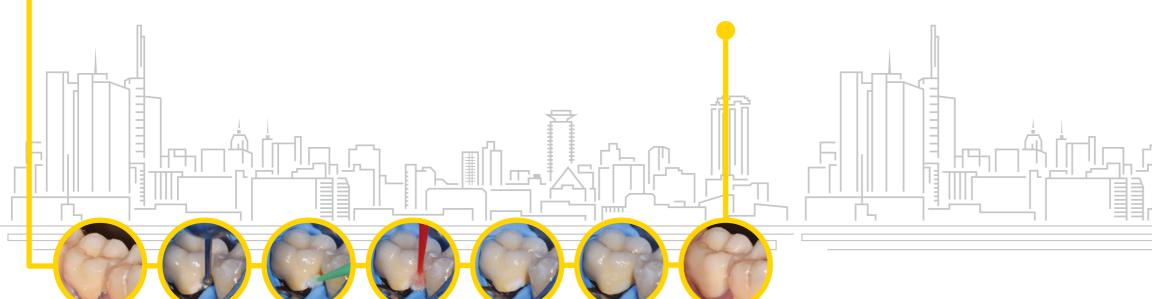
STEP 4

**Apply iBOND Universal** air dry and light cure

STEP 5

**Apply Venus Pearl** or Venus Diamond

# Repair of porcelain fused metal crown with exposed metal framework



Mesial and cervical partial fracture of the ceramic surface with Ceramic Primer on feldspathic ceramic a fine diamond bur veneering with exposure of the metal framework of surface for crown tooth 4.7.

Roughening the to create microroughness on the enhanced retention.

Apply iBOND the ceramic and allow it to evaporate for 20 sec. Air dry.

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

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

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

of the fractured ceramic margin by applying a layer of the corresponding Venus Pearl or composite shade followed by lightcuring, 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 iBOND **Ceramic Primer**  STEP 3

Apply iBOND Universal air dry, light cure

STEP 4

**Apply Venus Diamond** Flow Baseliner

STEP 5

**Apply Venus Pearl** or Venus Diamond

# i Bond®











#### **Contact in Germany**

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