

OptiBond® & OptiBond FL®



OptiBond is both a light- and dual-cure bonding agent designed to bond to composite, amalgam, porcelain and metal. It can also be used as an indirect pulp capper.

OptiBond FL is a **F**illed, **L**ight-cure adhesive offering a simple two-bottle process with only one light-curing step.

The dual-cure adhesive in OptiBond and the light-cure adhesive in OptiBond FL are 48% filled (with the same glass as Prodigy) and provide actual micromechanical retention to dentin tubules, decrease polymerization shrinkage and blend at the bond line, virtually eliminating the “white line” effect. It is believed that this reinforcing of the hybrid layer results in high bond strengths both initially and over the life of the restoration.

Both OptiBond and OptiBond FL are fluoride-releasing. Simple-to-follow laminated cards for ease of use at chairside – only four cards for a wide variety of procedures, eliminating confusion and saving time.

Reality Publishing 5 Star Award Winner 2000 and 2002.



Introduction Date

1994 & 1995

Packaging, Configuration, Specifications

<u>Part Number</u>	<u>Description</u>
OPTIBOND Refills	
24637	Prime – Bottle #1 (5 ml)
24638	Light-Cure Adhesive – Bottle #2 (5 ml)
24639	Dual-Cure Activator – Bottle #3A (5 ml)
24640	Dual-Cure Paste – Syringe #3B (pkg of 3)
26684 OPTIBOND FL Kit	
Contains:	
	1 Bottle (8 ml) OptiBond FL Prime
	1 Bottle (8 ml) OptiBond FL Adhesive
	1 Syringe (3 g) Gel Etchant
	10 Get Etchant Syringe Tips (disposable)
	25 Four-Cavity Mixing Wells (disposable)
	50 Kerr Applicators (disposable)
	1 Laminated Technique Card
OPTIBOND FL Refills	
25881	Prime – Bottle #1 (8 ml)
25882	Adhesive – Bottle #2 (8 ml)
Accessories	
24680	Kerr Applicators (disposable) (pkg of 200)
27157	Four-Cavity Mixing Well (pkg of 100)

Shelf Life

2 Years – Bottle #2, light-cure component (at ambient temperature)

1 Year – Bottle #3A and Syringe #3B, dual-cure components (at ambient temperature)

Properties

Other than the fluoride release (from the hexafluorosilicate), the presumed benefit of the filled adhesive is the lower modulus of elasticity. This lower modulus helps in two ways: (1) It could impart added flexibility to a restoration done with a stiff material such as a hybrid composite. Materials with more elasticity, such as microfills, are generally better retained in Class V lesions due to their higher flexibility, compared to hybrids. (2) The flexibility can help to reduce the stress at the interface between the restoration and tooth caused by polymerization shrinkage. By reducing this stress at the tooth-restoration interface, the restoration could be expected to have better retention.

Extraoral Working Time

About 3 minutes

Rock-Hard Extraoral Set Time

About 5 minutes

Directions

OPTIBOND – Bonding Composite or Amalgam to Dentin/Enamel

1. If external stains are present, cleansing of tooth with non-fluoridated pumice may be necessary to allow for correct shade selection.
2. Rubber dam placement is the preferred method for isolation. Isolation of Class V restoration can be achieved by placing Expa-syl gingival retraction paste or gingival retraction cord (non-impregnated) in conjunction with cheek retractors and/or cotton rolls.
3. a) Prepare cavity for posterior restoration using conservative cavity preparation principles.
 - b) Class V erosion lesions do not require cavity preparation; conservative beveling of adjacent enamel margins are indicated only for esthetics. Class V lesions are best cleaned with non-fluoridated pumice slurry delivered by a prophyl cup or brush on low speed handpiece.
4. Wash away all debris and lightly dry, leaving dentin moist. Moist dentin bonds best. Avoid desiccation of dentin.
5. OptiBond is an effective liner and pulp capping agent. Use of glass ionomer liner and/or calcium hydroxide is optional.
6. OptiBond can be used effectively with etched dentin/enamel or etched enamel. To etch dentin/enamel, apply Kerr Gel Etchant* or any 37.5% phosphoric acid to enamel surfaces. Then apply acid to dentin surfaces. (Etch enamel for not more than 30 seconds and dentin not more than 15 seconds.) Rinse thoroughly for 15 seconds and dry with oil-free air for 5 seconds.
7. a) Apply OptiBond FL Prime** (Bottle #1) to dentin and etched enamel surfaces with Kerr applicators, use continuous scrubbing motion of Prime with Kerr Applicators on the dentin surfaces for 30 seconds.
 - b) Air dry for 5 seconds.

NOTE: “Shiny” surface appearance will be observed.
8. a) Apply a uniform layer of OptiBond FL Adhesive (Bottle #2) to the dentin and enamel surfaces, using a fresh Kerr Applicator. Air thin where necessary, being careful not to desiccate the surface.

NOTE: Adhesive should be placed past the gingival margin on Class V restorations. Excess OptiBond FL will be finished and contoured during composite finishing and polishing, leaving smooth marginal surfaces.

 - b) Light cure for 30 seconds.***

9. Place composite in cavity, using an incremental layering technique (maximum depth of 2 mm layers), and light cure for 40 seconds.***

OPTIBOND – Composite Repair (Other than Microfills)

1. Prepare 2 to 3 mm bevel surrounding the fractured composite.
2. Apply a 9% to 12% hydrofluoric acid gel**** to a hybrid composite for 15 seconds. Be careful to avoid the mucosa. (For safety when using hydrofluoric acid, the use of a rubber dam is recommended.) Wash thoroughly (ALL GEL MUST BE REMOVED) and air dry well.

NOTE: If the restoration is microfill rather than a hybrid, complete removal of the microfill is indicated.

3. Place Silane coupling agent over all old composite and dry.
4. Apply the OptiBond FL Adhesive (Bottle #2) to the existing composite surface with a disposable Kerr Applicator. Apply a thin coat to the entire surface. Light cure for 30 seconds.***
5. Place composite in small increments (maximum depth 2 mm layers) to complete the composite repair. Light cure each layer a minimum of 40 seconds.***

OPTIBOND – Bonding Composite to Metal and Porcelain (Exposed Metal)

1. a) Prepare a 2 to 3 mm bevel surrounding fractured porcelain.
b) Clean metal of debris, if necessary – sandblast when possible. It is sometimes advantageous to create undercuts within metal.
2. Apply 9 to 12% hydrofluoric acid gel**** to the porcelain surfaces for 4 to 5 minutes. (For safety when using hydrofluoric acid, the use of a rubber dam is recommended.) Wash thoroughly (ALL GEL MUST BE REMOVED) and air dry.
3. Coat all surfaces with OptiBond FL Prime** (Bottle #1). Dry for 5 seconds.
4. Apply the OptiBond FL Adhesive (Bottle #2) to the porcelain and metal with a disposable Kerr applicator. Apply a thin coat to the entire area. Polymerize for 30 seconds.***
5. Use a light-curable opaquer to cover the metal.
6. Place composite in small increments (maximum 2 mm layers) to complete the porcelain repair. Light cure each layer a minimum of 40 seconds.***

OPTIBOND – Bonding Composite or Amalgam to Dentin/Enamel

1. Prepare the tooth using the proper procedure for inlay or onlay. Wash away debris and air dry lightly.
2. Rubber dam placement is the preferred method for isolation. Cotton rolls can also be used for protecting against moisture/saliva contamination.
3. OptiBond can be effectively used with etched dentin/enamel or etched enamel. To etch dentin/enamel, apply Kerr Gel Etchant* or any 37.5% phosphoric acid to enamel surfaces. Then apply acid to dentin surface. (Etch enamel for not more than 30 seconds and dentin not more than 15 seconds.) Rinse thoroughly for 15 seconds and dry with oil-free air for 5 seconds.
4. Apply OptiBond Prime** (Bottle #1) to dentin and etched enamel surfaces with Kerr Applicators, scrubbing the dentin surfaces for 30 seconds.
5. Air dry for 5 seconds. NOTE: “Shiny” wet surface appearance will be observed.
6. Dispense the OptiBond Dual Cure Paste (Syringe 3B) one-quarter turn and push into a disposable mixing well. Place one drop of Dual Cure Activator 3A (Bottle #3A) directly onto the dispensed resin. Thoroughly mix for 15 seconds.

NOTE: Prior to light curing, OptiBond Dual Cure has an approximate working time of 4 1/2 minutes.

7. Apply the mixed dual cure to dentin with a fresh disposable Kerr Applicator. Apply a thin coat to entire dentin and enamel surfaces. The agent was designed to adhere to the walls and fill the fine angles. (Do not air thin.) **DO NOT LIGHT CURE.**
8. Coat the silanated restoration (internally etched porcelain or resin: inlays, onlays or veneers) with a dual-cure resin such as Nexus 2.
9. Seat the restoration. Remove the excess resin and light cure the margins for 60 seconds for each buccal, lingual and occlusal angle.***
10. Trim and polish all margins.

OPTIBOND FL – Composite Restorations and Core Buildup Materials

1. Isolate and dry.
2. Place Kerr Gel Etchant* or any 37.5% phosphoric acid on enamel and dentin (as a general guideline, a maximum of 30 seconds for enamel and 15 seconds for dentin.). Wash with water until certain that etchant has been removed (approximately 15-30 seconds). Gently air dry for a few seconds, being sure not to desiccate dentin.
3. Dispense OptiBond FL Prime** (Bottle #1) into disposable mixing well. Apply with Kerr Applicator over enamel and dentin surfaces with light scrubbing motion for 30 seconds. Gently air dry (approximately 5 seconds). **DO NOT DESICCATE.** At this point the dentin surface should have a slightly shiny appearance. Do not allow salivary contamination.
4. Dispense and apply OptiBond FL Adhesive (Bottle #2) uniformly over enamel and dentin with a Kerr Applicator, creating a thin coating. If necessary, blow to margin or thin using light air application.
5. Light cure for 30 seconds.***
6. Proceed with composite placement.

NOTE: For procedures that require the extra security of an added chemical cure, OptiBond Dual Cure components 3A & 3B may be purchased separately. When mixed, this component provides the same filled technology and fluoride release as the OptiBond FL Adhesive provided in the kit.

OPTIBOND FL – Indirect Ceramic/Composite Inlays, Onlays and Crowns

1. Prepare tooth, rinse and dry.
2. Place Kerr Gel Etchant* on enamel and dentin for 15 seconds. Wash with water until certain that etchant has been removed – approximately 15 to 30 seconds. Gently air dry for a few seconds, being sure not to desiccate dentin.
3. Dispense OptiBond FL Prime (Bottle #1) into Kerr disposable mixing well. Apply with Kerr Applicator tip over enamel and dentin surfaces with light scrubbing motion for 15 seconds. Gently air-dry (approximately 5 seconds). **DO NOT DESICCATE.** At this point the dentin surface should have a slightly shiny appearance. Do not allow salivary contamination. **DO NOT LIGHT CURE.**
4. Apply luting cement according to manufacturer's instructions for use.
5. Seat restoration.
6. Light cure restoration for 40 seconds per surface.

- * **CAUTION:** Kerr Gel Etchant contains 37.5% phosphoric acid. Avoid contact with skin, eyes and soft tissue. In case of contact with skin or eyes, flush immediately with water, get medical attention for eyes. Do not take internally.
- ** **CAUTION:** OptiBond Prime (Bottle #1) – Avoid contact with skin, eyes and soft tissue. Wash skin with water after contact. Material may cause dermatitis.
- *** **RECOMMENDED CURE TIMES:** Optilux 501 in Boost Mode 10 seconds, Ramp Mode 20 seconds or Regular Mode 20 seconds. For all other lights, see manufacturer’s recommendation.
- **** **CAUTION:** Hydrofluoric Acid – Avoid contact with skin, eyes, and soft tissue. In case of contact with skin or eyes, flush immediately with water and get medical attention. Do not take internally. The use of a rubber dam is recommended for safety when using HF.
- CAUTION:** Uncured methacrylate resin may cause contact dermatitis and damage the pulp. Avoid contact with skin, eyes and soft tissue. Wash thoroughly with water after contact.

Composition

OPTIBOND CATALYST (Bottle #3A)

<u>Component</u>	<u>Description</u>
BISGMA	Bis-phenol-A-bis-(2-hydroxy-3-methacryloxypropyl) ether
BPO	Benzoyl peroxide
UV-9	2-Hydroxy-4-methoxybenzophenone
BHT	2,6-Di- <i>tert</i> -butyl-4-methylphenol
CQ	1,7,7-Trimethylbicyclo-[2.2.1]-hepta-2,3-dione
HEMA	2-Hydroxyethylmethacrylate
PAMA	Phthalic acid monomethacrylate

OPTIBOND ACCELERATOR PASTE (Syringe #3B)

<u>Component</u>	<u>Description</u>
BISGMA	Bis-phenol-A-bis-(2-hydroxy-3-methacryloxypropyl) ether
DHEPT	N,N-Di-(2-hydroxyethyl)-4-toluidine
HEMA	2-Hydroxyethylmethacrylate
GDM	Glycerol dimethacrylate
ODMAB	2-(Ethylhexyl)-4-(dimethylamino)benzoate
TS530	Fumed silicon dioxide
A174	<i>gamma</i> -Methacryloxypropyltrimethoxysilane
SP345	Barium aluminoborosilicate
OX-50	Fumed silicon dioxide
BA20	Barium aluminosilicate
Na ₂ SiF ₆	Disodium hexafluorosilicate

OPTIBOND LIGHT CURE (Bottle #2)

<u>Component</u>	<u>Description</u>
TEGDM	Triethyleneglycoldimethacrylate
GPDM	Glycerol phosphate dimethacrylate
UDMA	7,7,9-Trimethyl-4,13-dioxo-3,14-dioxa-5,12-diazahexadecane-1,16-dimethacrylate
ATPU	4-Cyclohexyl(ethylmethacryl)carbamate
	4'-cyclohexyl(polyethoxy)carbamate methane
CQ	1,7,7-Trimethylbicyclo-[2.2.1]-hepta-2,3-dione

Composition (continued)

OPTIBOND FL ADHESIVE

<u>Component</u>	<u>Description</u>
BISGMA	Bis-phenol-A-bis-(2-hydroxy-3-methacryloxypropyl) ether
CQ	1,7,7-Trimethylbicyclo-[2.2.1]-hepta-2,3-dione
HEMA	2-Hydroxyethylmethacrylate
GDM	Glycerol dimethacrylate
ODMAB	2-(Ethylhexyl)-4-(dimethylamino)benzoate
TS530	Fumed silicon dioxide
A174	<i>gamma</i> -Methacryloxypropyltrimethoxysilane
OX-50	Fumed silicon dioxide
SP345	Barium aluminoborosilicate
Na ₂ SiF ₆	Disodium hexafluorosilicate

OPTIBOND FL PRIME/OPTIBOND PRIME

<u>Component</u>	<u>Description</u>
EtOH	Ethanol
CQ	1,7,7-Trimethylbicyclo-[2.2.1]-hepta-2,3-dione
HEMA	2-Hydroxyethylmethacrylate
GPDM	Glycerol Phosphate dimethacrylate
BHT	2,6-Di-(<i>tert</i> -butyl)-4-methylphenol
H ₂ O	Water
PAMA	Phthailic Acid monomethacrylate

Physical Properties

	OptiBond (Auto Cure)	OptiBond (Dual Cure)	OptiBond FL
Diametral Str (Mpa)	33	41	34
Compressive Str Mpa	287	320	363
Flexural Str (Mpa)	78	109	
Rockwell Hardness	63.4	67.2	68.7
F-Release (ppm/wk)	4	4	0.5
Working Time		5	
Set Time (min)		8	
Adhesion – Etched occlusal dentin (Mpa)		26.9	19.3
Adhesion – Unetched dentin (Mpa)		24.1	
Adhesion – Enamel (Mpa)		23.4	21.4
Adhesion – Porcelain (Mpa)		19.3	18.6
Adhesion – Composite (Mpa)		20.7	15.9
Adhesion – Gold (tin plate) (Mpa)		22.1	23.4
Adhesion – Rexillium (tin plate) Mpa		22.1	27.6
Adhesion – Amalgam (Mpa)		5.8	6.9

Features and Benefits

Features

- Filled technology
- Fluoride release
- Ethanol instead of acetone

Benefits

- Strong bond
- Less polymerization shrinkage
- Less microleakage
- Better protection against “white line”
- Pulp capping
- Caries protection
- Use in moist or dry environment
- No need for multiple coats
- Less sensitivity