

OptiBond All·In·One. Self-Etch Adhesive



PRODUCT MANUAL

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Product Description

OptiBond All-In-One is a single component light-cured self-etching adhesive categorized in the 7th generation of dental adhesives. Our All-In-One material combines the ingredients needed for etching, desensitizing, priming, and bonding into a single adhesive solution, thereby eliminating these separate steps of the bonding process. OptiBond All-In-One can be used for the bonding of both direct and indirect restorations. Its unique ternary solvent system, comprised of water, ethanol and acetone provide enhanced shelf-life stability and effective enamel etching for long-term bond performance. The advantages of using a single component adhesive include simplified bonding procedures and a reduction of post-operative sensitivity. OptiBond All-In-One adhesive employs Kerr's well-proven GPDM adhesive monomer and filled adhesive technology (utilizing a combination of fillers including a nano-filler and a fluoride releasing filler). This unique technology ensures the highest level of protection against microleakage while providing high bond strengths to a variety of substrates. OptiBond All-In-One is available in both bottle and Unidose deliveries.

Part Numbers

33381 Bottle Kit	One 5ml bottle, three unidose samples, box of 50 applicators, 25 disposable mixing wells, directions and laminated technique card
33383 50-Pack Unidose	50 Unidose devices, box of 50 applicators, directions and laminated technique card

OptiBond All-In-One Features and Benefits

Features	Benefits
7 th Generation adhesive	Single component - greatly simplifies the restorative procedure
Unique "nano-etching"	Provides high mechanical retention
Direct & indirect	Excellent adhesion to enamel, dentin, porcelain and advanced ceramics – even indirect metal-based restorations when used with Maxcem resin cement
Nano-filled, fluoride releasing	High bond strength, minimized microleakage and sensitivity, prevention of secondary cavities
Unique ternary solvent system	Water, acetone & ethanol provide effective enamel etching & enhanced material stability

Shelf Life

2 years

Refrigeration required – 2-8°C

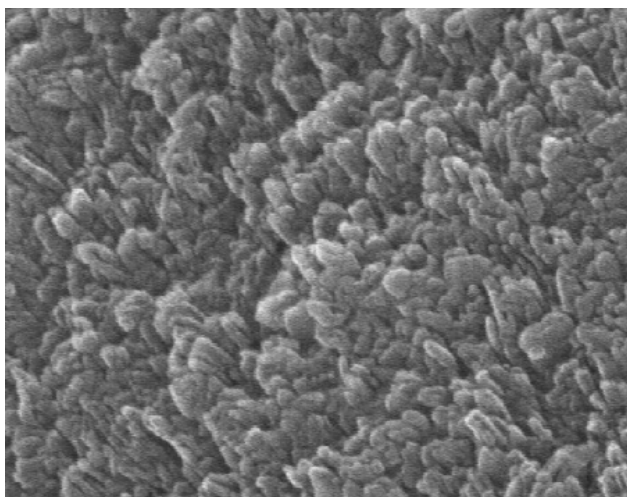
Obsolete Products

OptiBond Solo Plus Self-Etch (bottle and Unidose) will be discontinued effective December 31st, 2006. Current users will be notified through the dealers and Kerr by mail and outbound telesales and encouraged to convert over to OptiBond All-In-One.

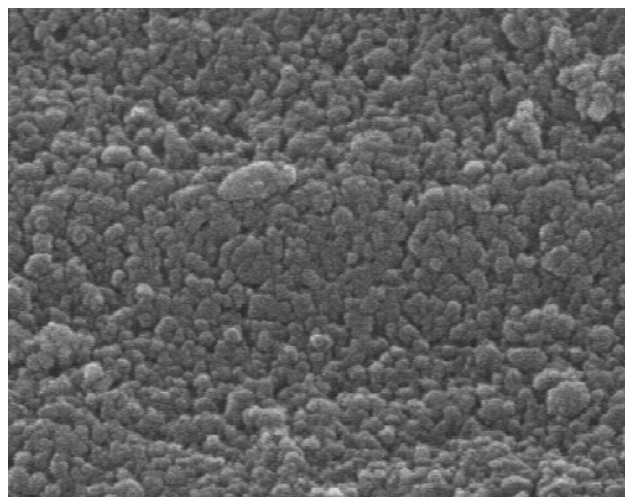
Product Features

Performance, Versatility and Predictability – All the essential ingredients needed for etching, desensitizing, priming, and bonding are combined together into a single component or a single bottle, eliminating the need for separate steps. OptiBond All•In•One is a single component system with no mixing required. As a result, the restorative procedure is significantly simplified, becoming more consistent or much less technique sensitive.

Universal Applications



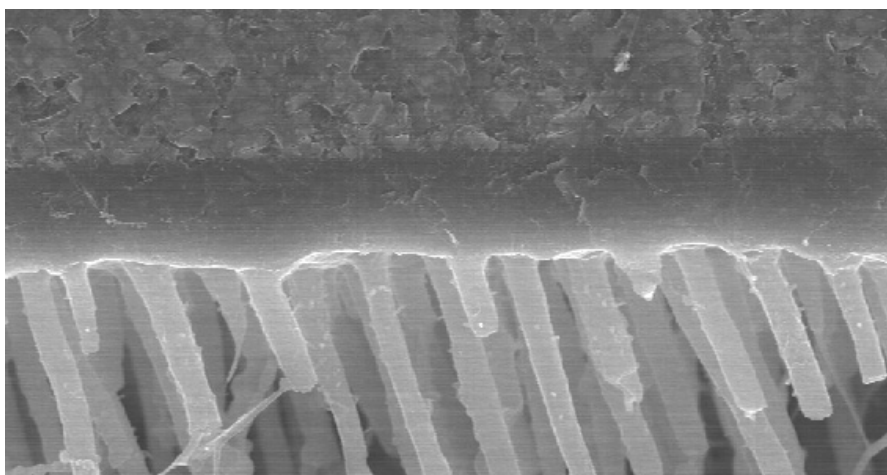
OptiBond All•In•One Adhesive Competitive
Magnification 50'000



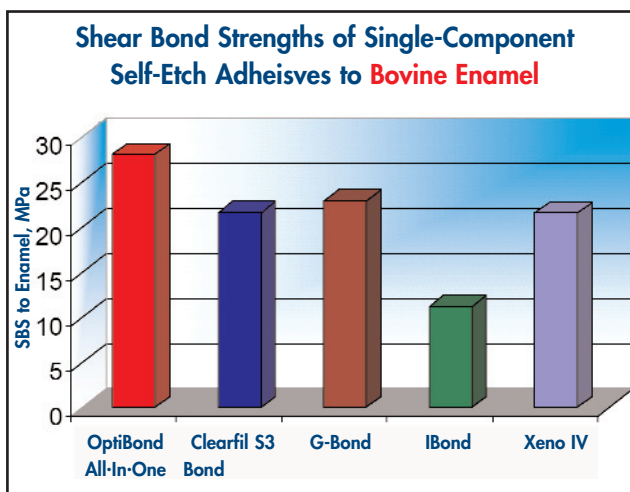
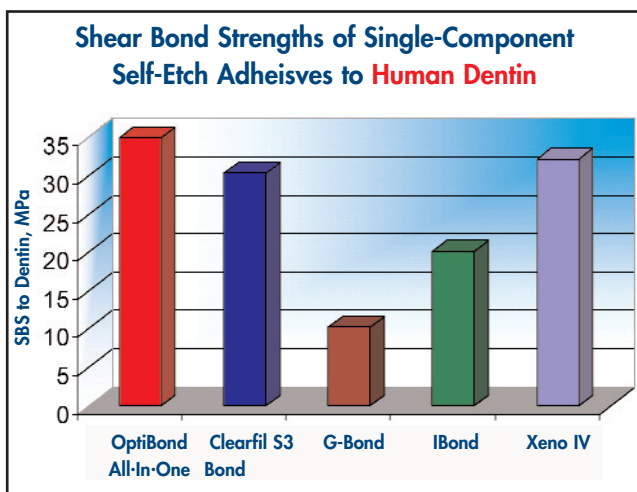
Competitive 7th generation adhesive
Magnification 50'000

Effective Enamel Etching – is achieved by OptiBond All•In•One adhesive as evidenced by this SEM photograph, showing rough enamel surface and exposed enamel hydroxyapatite nano-crystals ('Nano-etching') after treatment with Optibond All•In•One. The resulting surface morphology provides an opportunity for mechanical retention to improve enamel adhesion. The resulting rough surface also provides increased surface area available for chemical bonding between the GPDM acidic monomer and calcium ions from hydroxyapatite crystals. Optibond All•In•One adhesive exhibited a much more effective etching (deeper etching pattern and rougher etched surface) on enamel than a competitive 7th generation dental adhesive (see SEM photos above for comparison).

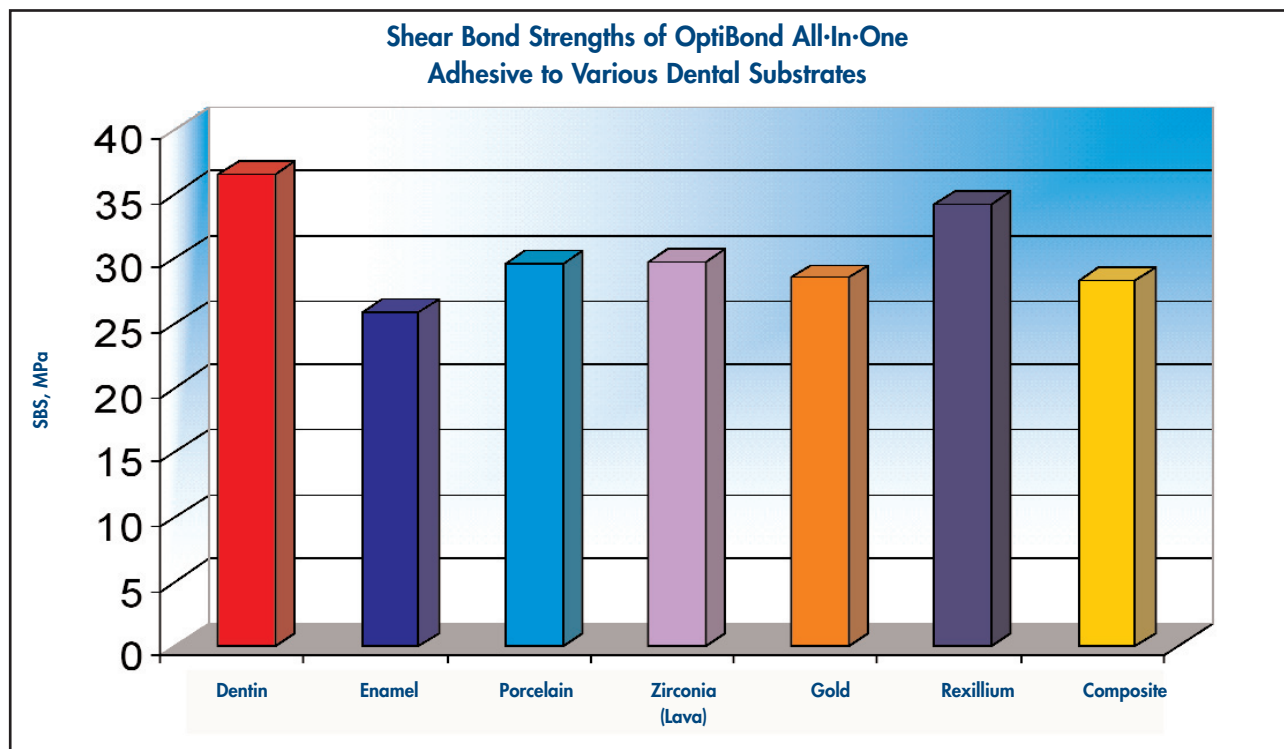
Dentin Interface and Superb Sealing Ability Provides a Well Defined Adhesive – This SEM photograph shows the composite, adhesive, and dentin bonding interfaces. Excellent monomer penetration into dentinal tubules, shown as well defined long resin tags, was achieved. This yields high bond strength, provides a durable bond between the adhesive and dentin substrates, and offers great protection against microleakage and sensitivity. The film thickness of Optibond All-In-One adhesive, shown in this SEM, is about 5 microns.



Direct Applications – utilizing Kerr’s well-proven GPD (glycerol phosphate dimethacrylate) adhesive technology and filled adhesive technology together, OptiBond All-In-One’s unique ternary solvent system provides excellent adhesion to many dental substrates including dentin, enamel, metal alloys (both precious and non precious), porcelain, and advanced ceramic system such as zirconium oxide (e.g. LAVA).



Study conducted by Dr. James Dunn of Loma Linda University:
Direct bonding using light-cured Herculite XRV composite resin.



Internal Testing Data: Direct bonding using light-cured Herculite XRV composite resin.

Indirect Applications – Low film thickness (~5 microns) makes OptiBond All•In•One adhesive well-suited for indirect restorations since it will not interfere with final seating

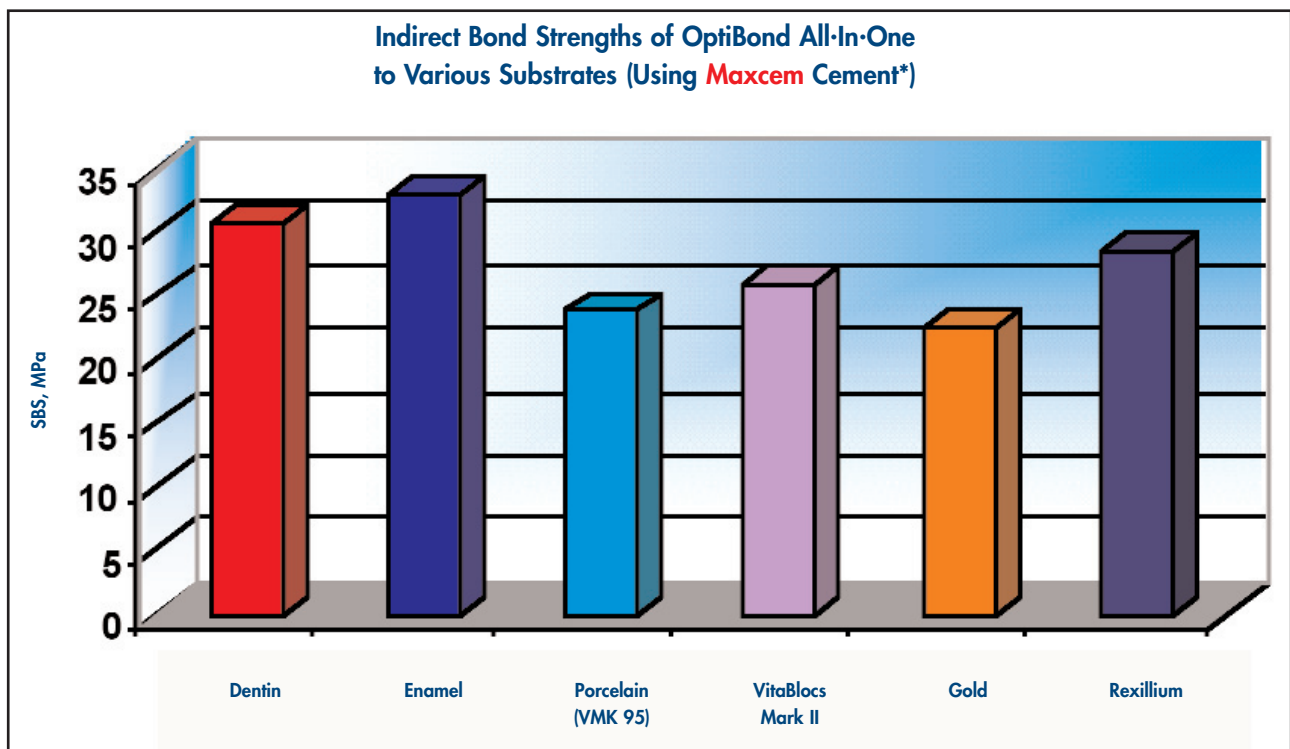
- Most light-cure or dual-cure resin cements (i.e. Maxcem, Nexus 2) can be used with OptiBond All•In•One adhesive to cement indirect restorations as long as there is good light accessibility
- Maxcem is recommended for **indirect situations where there is poor or no light accessibility** – there is no need for a separate dual-cure activator if Maxcem is used in either a self-cure or dual-cure mode.
- Excellent indirect bond strengths to a variety of dental substrates

Most light-cure or dual-cure resin cements (i.e. Maxcem, Nexus2) can be used with All•In•One to cement indirect restorations with good light accessibility. However, only Maxcem can be used with All•In•One when there is poor or no light accessible. The compatibility of Maxcem's proprietary redox initiator system is what enables it to work effectively with All•In•One's acidic chemistry in a dark-cure situation. This eliminates the need for a separate dual-cure activator.

It's a known fact by the research community that incompatibilities exist between acidic adhesives and the self-cure mode of resin cements. The acidity levels of the newer self-etch single component

bonding agents are much higher than their earlier predecessors. Therefore, there is a more pronounced incompatibility issue with resin cements in self-cure mode. Phase separation at the adhesive/resin cement interface occurs due to inadequate or poor curing. The self-cure redox initiator system in current resin cements comprises a BPO catalyst and a tertiary amine activator. Upon curing of the adhesive, there is an oxygen-inhibited layer on the surface. When the resin cement comes in contact with the adhesive in a self-cure or dark-cure mode, uncured acidic monomers within the oxygen-inhibited layer of the adhesive can neutralize the tertiary amine and adversely affect the self-cure mechanism of the resin cement. The end result is poor adhesion at the adhesive/cement interface.

This is where Maxcem enters the equation. Maxcem employs a new proprietary redox initiator system that is acid resistant and self-cures efficiently in the presence of strong acidic monomers. This



*OptiBond All-In-One adhesive was light-cured and Maxcem cement was self-cured.

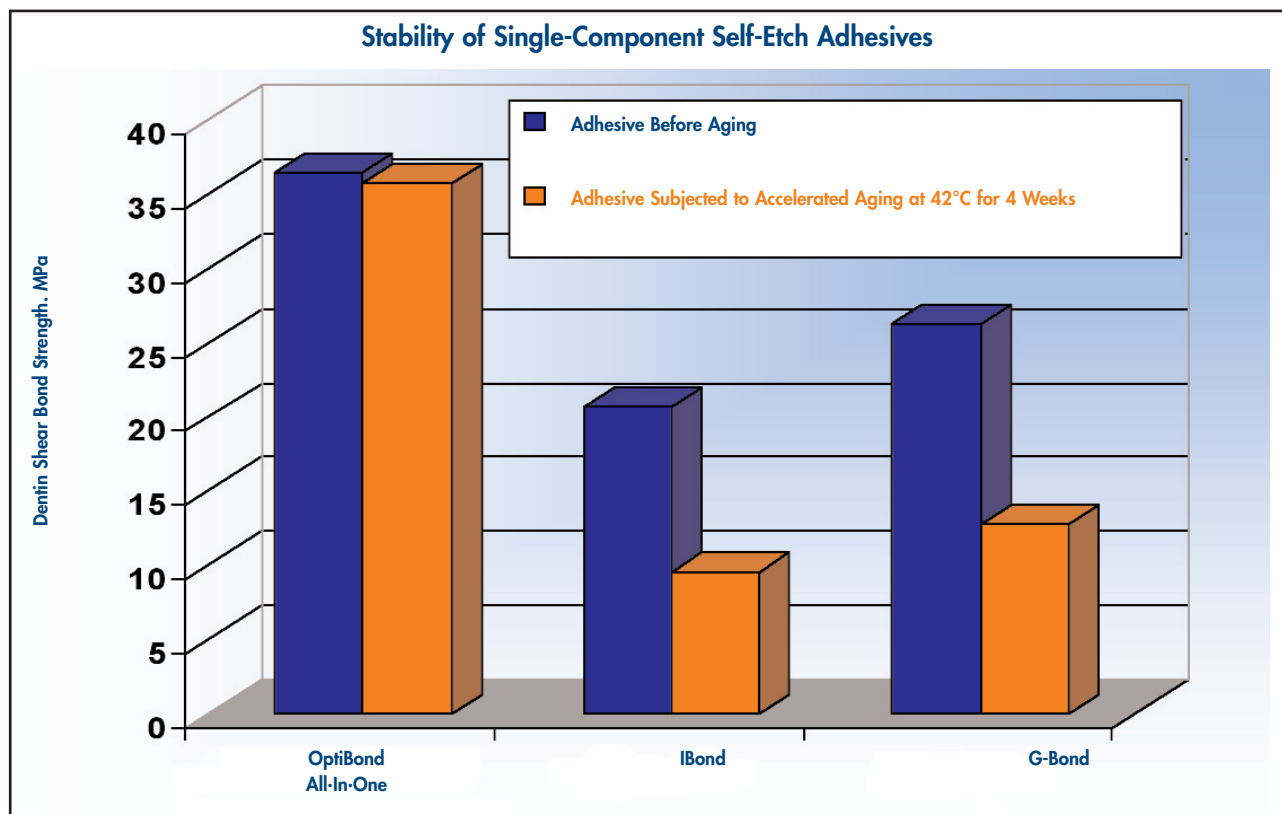
makes Maxcem compatible with the OptiBond All-In-One adhesive.

Physical Properties

Reduced post-operative sensitivity – Because of Optibond All-In-One’s self-etching property, the smear layer covering the dentin surface is not removed (rather the smear layer is modified by the acidic monomer) and the dentinal tubules are not opened. The adhesive monomers in OptiBond All-In-One adhesive penetrate well into the dentinal tubules forming long resin tags upon curing of the adhesive. The long resin tags along with a uniformly overlaying well-cured (or crosslinked) adhesive layer, reinforced with fillers, forms a formidable seal/barrier against fluid movement. As a result, the occurrence of post-operative sensitivity will be significantly reduced.

Unique Ternary Solvent System – Three solvents (water, acetone and ethanol) are used in OptiBond All-In-One to provide the following benefits:

- **Effective enamel etching** (refer to SEM photo) - superior bonding efficacy to both dentin and enamel.
- **Enhanced material shelf-life stability** – adhesive performance will not degrade over time.
- **Homogeneous adhesive layer** – adhesive interface maintains a uniform composition as solvents are removed during air drying. This reduces the chance for phase separation and bubble (void) formation known to occur in other brands.



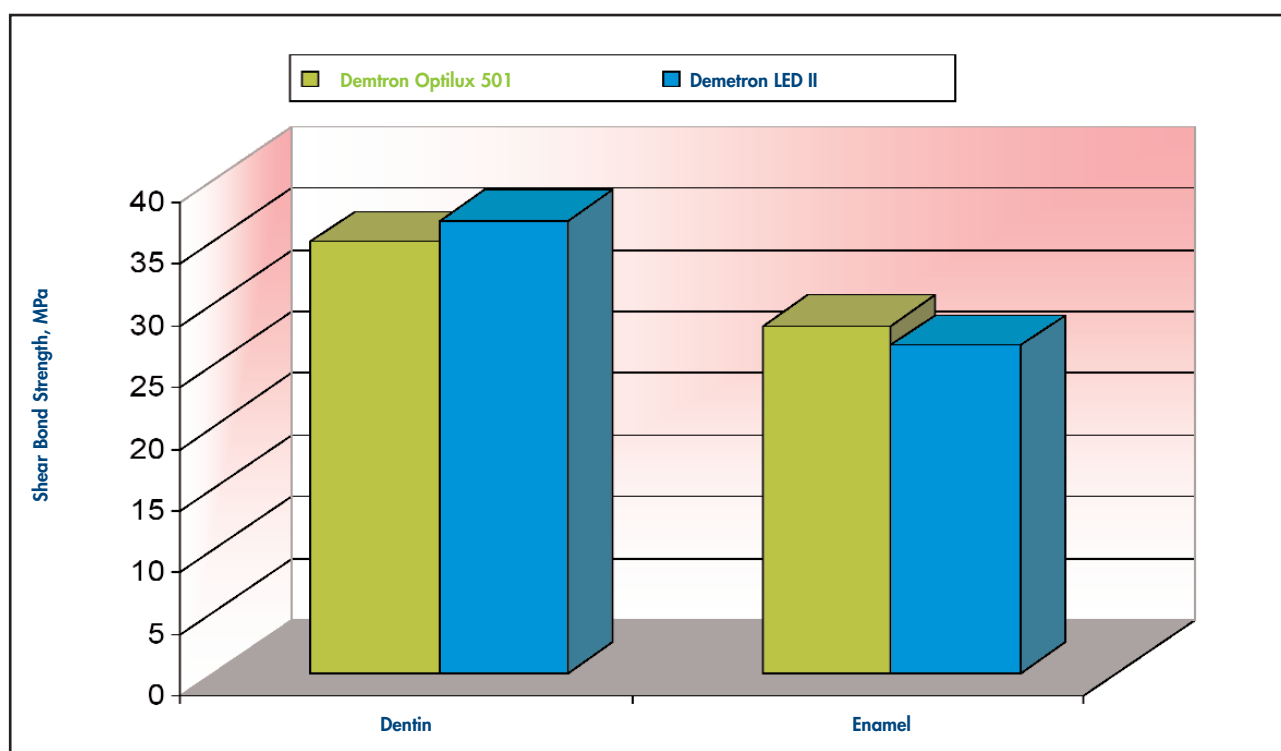
* iBond - the aging data is for 3 weeks since the solution gelled at week 4

Balanced Hydrophilicity and Hydrophobicity – The hydrophilic and hydrophobic monomers are carefully balanced in OptiBond All-In-One so that it can effectively wet, etch and prime (or penetrate) various dental substrates, be efficiently light-cured (and crosslinked), and be compatible with composite filling materials or resin cements.

Fluoride-Releasing Agent/Filler – A fluoride-releasing filler (sodium hexafluorosilicate) is incorporated in OptiBond All-In-One adhesive.

Filled Adhesive Technology – OptiBond All-In-One adhesive incorporates several fillers including a discrete nano-filler. This proven filled adhesive technology, together with fluoride-releasing filler, ensures the highest protection against microleakage while providing superior bond strengths to a variety of substrates.

Works with Both QTH Halogen and LED Curing Lights – OptiBond All-In-One adhesive uses a CQ photo-initiator and therefore it can be light-cured effectively with either conventional QTH halogen curing lights or new LED curing light technology.



Study conducted by Dr. James Dunn of Loma Linda University

Material Composition

- Monomers
 - Glycerol phosphate dimethacrylate (GPDM) – self-etching adhesive monomer
 - Co-monomers including mono-, and di-functional methacrylate monomers
- Solvents: water, acetone, and ethanol
- Photo-initiator: Camphorquinone-based photo-initiator system
- Fillers: three nano-sized fillers are used in OptiBond All•In•One adhesive, including a discrete nano-silica filler
- Fluoride-releasing Fillers: Sodium hexafluorosilicate

OptiBond All•In•One Directions for Use

1. Prepare cavity or prep.
2. **For bottle:** Dispense 2-3 drops of OptiBond All•In•One adhesive into a clean well.
For Unidose container: Open the container and insert the applicator into the container to saturate the applicator tip.
3. Apply a first application of OptiBond All•In•One adhesive with brushing motion for 20 seconds.
4. Apply a second application of OptiBond All•In•One adhesive with brushing motion for 20 seconds.
5. Thoroughly dry the adhesive for at least 5 seconds.
6. Light cure for 10 seconds.
7. Apply composite or cements according to manufacturer's instructions for use.

Competitive Landscape

Brand	Pkg	Protocol	Solvent	Water	Organic Solvent	Fillers	Fluoride
All-In-One	Btl/Unidose	Apply 2X Air Dry, LC 55 sec	W,E,A Nano-silica	~10%	~48%	~7%	Yes
Xeno IV	Btl/Unidose	Apply 2X Air Dry, LC 55 sec	W,A	~13%	~46%	~0%	Yes
Clearfil S3	Btl/Unidose	Apply 1X Air Dry, LC 35 sec	W,E	~12%	~20%	~10%	No
iBond	Btl/Unidose	Apply 3X Air Dry, LC 65 sec	W,A	~27%	~37%	~0%	No
G Bond	Btl/Unidose	Apply 1X Air dry, LC 25 sec	W,A Nano-filled	~20%	~34%	~3%	No

Solvents: W = Water, E = Ethanol, A = Acetone

	Direct Composite	Indirect w/Light	Indirect w/o Light
OptiBond All-In-One	Yes	Yes	Yes*
Xeno IV	Yes	Yes	Yes**
iBond	Yes	Yes	No
Clearfil S3	Yes	No	No
G Bond	Yes	Yes	No

* Maxcem is recommended for situations when there is poor or no light – Maxcem either self-cured or dual-cured is compatible with OptiBond All-In-One. Remember - the adhesive needs Maxcem, not the other way around!

** Xeno IV recently announced a separate dual-cure activator kit that includes one 4.5ml bottle adhesive and one 4.5ml bottle dual-cure activator.

OptiBond All-In-One Key Differentiators

- **No mixing of multiple components required:** OptiBond All-In-One is ready right out of the bottle (or unidose device!)
- **Bond strength durability:** Unique nano-etching delivers high mechanical retention for long-term bond strength
- **Unique Ternary Solvent System provides:**
 - **Enhanced shelf life stability** – doesn't degrade to affect performance
 - **Nano-etching ability** – higher mechanical retention
 - **Homogeneous adhesive layer** – adhesive interface maintains a uniform composition as solvents are removed during air drying
- **Universal use:** Excellent adhesion to enamel, dentin, porcelain & ceramics – even indirect metal-based restorations when used with Maxcem – no separate dual-cure activator is required
- **Minimized post-op sensitivity:** Proven filler technology greatly reduces microleakage and post-operative sensitivity concerns
- **All-In-One releases fluoride:** Not all 7th generation self-etch bonding agents have this capability
- **Unique unidose device:** Free-standing delivery device for ease-of-use
- **Independent bonding data:** Available for viewing on the KerrDental.com web site
- **OptiBond name:** the most trusted name in bonding

