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# Biomaterials Research Report

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# Bond Strength of G2-BOND Universal

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## Introduction:

***G2-BOND Universal*** is the latest 2-bottle addition to GC's adhesive portfolio to compete with self-etch and etch and rinse system. The primer has optimal hydrophilic properties to increase dentin penetration for sealing, strength and self-etching properties, while the HEMA-free hydrophobic layer reduces hydrolytic degradation for increased durability and interfaces with composite. DENTAL ADVISOR tested the initial bond strength and bond strength after accelerated aging and 12 month water storage of this new system compared to gold-standard self-etching ***Clearfil SE Bond 2***, and Etch and Rinse ***Optibond FL.***

## Experimental Design:

**MATERIALS:**

*Bonding Agents:* ***G2-BOND Universal*** (GC America), ***Clearfil SE Bond 2*** (Kuraray), ***Optibond FL*** (KaVo Kerr)

*Composite:* ***G-aenial Universal Injectable*** (GC America)

**TEST PARAMETERS:**

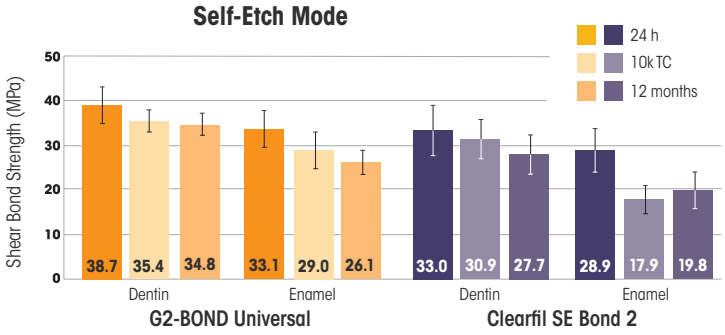
*Substrates:* Human Superficial Dentin, Human Ground Enamel

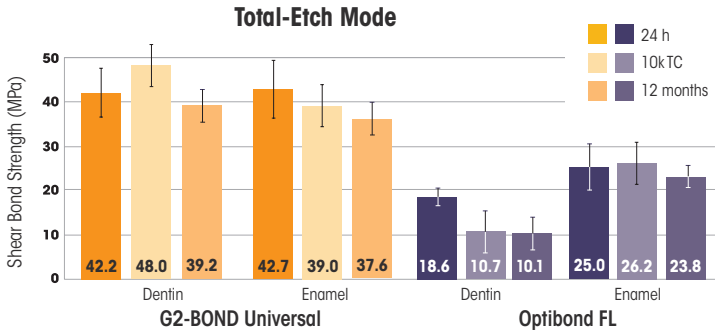
*Etching Mode:* Self-etch, Total-etch

*Storage Conditions:* 24 hours, 10000 Thermocycles (10k TC), 12 months


## Methods:

*Direct Shear Bond Strength [n=8] per bonding agent to dentin, enamel with self-etch and total-etch modes:* Human adult molars, sterilized in a 1 % Chloramine T solution, and stored in deionized water were embedded in acrylic resin discs and ground through 600-grit SiC paper to form bonding substrates of superficial dentin and ground enamel. Specimen surfaces were treated and bonding agent placed according to manufacturer instructions. ***G-aenial Universal Injectable*** was then placed on top of the bonding agent utilizing the Ultradent Shear Test mold and jig to produce a 2.38 mm diameter shear test cylinder according to ISO 29022:2013. The cylinder was light cured for 20 seconds while in the mold. The specimens were then transferred to a 37°C deionized water bath for 24 hours storage until testing or thermocycling. Thermocycling was performed by transferring specimens between a 5° C and 55° C water bath with a 20s dwell time for 10000 cycles. Specimens were also stored for 12 months in distilled water at 37°C with weekly water change.




## Results:

*No application issues were observed with* ***G2-BOND Universal*** *and achieving a consistent bonding film thickness was simple.*

## Conclusion:

***G2-BOND Universal*** performed better than ***Clearfil SE Bond 2*** and ***Optibond FL*** tested in their respective etching modes to dentin and enamel in immediate 24h shear bond strength and after accelerated aging and 12 month storage.