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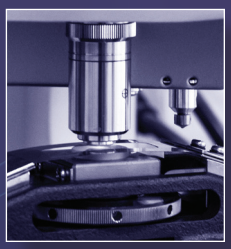
Biomaterials Research Report

Matt Cowen, B.S.
DENTAL ADVISOR Biomaterials Research Center
3110 West Liberty, Ann Arbor, MI 48103
(734) 665-2020, ext. 111
matt@dentaladvisor.com



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# Bond Strength of Ecosite Bond

M. Cowen, J.M. Powers

## Experimental Design:

### MATERIALS:

**Materials: Composite: *Ecosite Bond*** (DMG America) [lot: 768870], ***Ecosite Bulk Fill*** (DMG America)

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

**Substrates:** Human Superficial Dentin and Human Ground Enamel

### METHODS:

**Shear Bond Strength, n=8 per test group:** Human, adult, extracted third molars, sterilized in a 0.5% chloramine T solution, were embedded in acrylic resin discs and ground through 600-grit SiC paper to form bonding substrates of superficial dentin and ground enamel. Specimens were then ultrasonically cleaned in deionized water for 5 minutes. For total-etch specimens, a 35% phosphoric acid etchant was applied for a 15 seconds dwell time on dentin, and 30 second dwell time on enamel.

The bonding agent was applied to the substrate according to the manufacturer's instructions including 10 seconds of rubbing, 20 seconds of dwell time and at least 5 seconds of air drying followed by light curing for 10 seconds using an Elipar Deep Cure-S CLU. ***Ecosite Bulk Fill*** 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 until testing. Testing was performed using an Instron 5866 at a crosshead speed of 1 mm/min and shear bond strength results given with means and standard deviations and failure mode analyzed using a 45X light microscope.

## Results:

| *Results Summary, Means (Standard Deviation)* | | | | |
|---|---|---|---|---|
| Substrate | Dentin | | Enamel | |
| *Etching Mode* | Self-Etch (n=8) | Total-Etch (n=8) | Self-Etch (n=8) | Total-Etch (n=8) |
| *Bond Strength, MPa* | 30.0 (5.0) | 32.7 (4.5) | 21.1 (3.0) | 26.8 (3.8) |
| *Adhesive Failure Mode, %* | 62.5% | 75% | 100% | 100% |
| *Mixed Failure Mode, %* | 37.5% | 25% | 0% | 0% |

## Conclusion:

***Ecosite Bond*** produced excellent bond strengths to dentin and enamel in self-etch and total-etch modes. There were no bonding failures between ***Ecosite Bond*** and ***Ecosite Bulk Fill*** indicating compatibility between these materials.