



## Compatibility of Ecosite Bulk Fill to Bonding Agents

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### Purpose:

This project tested the compatibility of **Ecosite Bulk Fill** to four different generations of bonding agents on human dentin.

### Experimental Design:

**Composite:** **Ecosite Bulk Fill** (DMG America) [lot: 788810]

### Bonding Agents:

- 4th generation bond: **Clearfil Photo Bond** (Kuraray) [lot: 000058] Total-Etch
- 5th generation bond: **Prime & Bond NT** (Dentsply) [lot: 1804000165] Total-Etch
- 6th generation bond: **Futura Bond M** (Voco) [lot: 1817242] Self-Etch
- 7th generation bond: **Ecosite Bond** (DMG America) [lot: 788410] Self-Etch
- Tooth Conditioner: **Scotchbond Universal Etchant** (3M)

**Substrates:** Human Superficial Dentin

**Storage:** 24h or 5000 thermocycles between 5°C and 55°C

### METHODS:

**Shear Bond Strength, n=10 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 using **Clearfil Photo Bond** and **Prime & Bond NT**, a 35% phosphoric acid etchant was applied for a 15 seconds dwell time on dentin.

The bonding agent was applied to the substrate according to the manufacturer's instructions followed by light curing for 10 seconds using an Elipar Deep Cure-S curing light unit. **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 or 5000 thermocycles with a 20 second dwell time between 5°C and 55°C. 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:

Bond Strength Results Summary, MPa				
	Clearfil Photo Bond	Prime & Bond NT	Futura Bond M	Ecosite Bond
24h	25.2 (8.0)	32.7 (9.2)	20.0 (3.6)	30.0 (5.0)
5000 TC	17.9 (6.3)	27.9 (6.3)	20.8 (4.4)	30.1 (7.3)

There were zero debonding failures at the composite to adhesive interface indicating compatibility of **Ecosite Bulk Fill** to these 4 generations of bonding agents.

### Conclusion:

There was no decrease in bond strength to dentin after thermocycling for **Ecosite Bond**.