

Bond Strength Testing of G-CEM ONE

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Introduction:

G-CEM ONE is the latest in a series of universal cements which may be used with or without an additional primer to a variety of surfaces. In this case, it also includes an additional Adhesive Enhancing Primer with touch-curing technology which allows rapid curing of the cement at the critical tooth interface to prevent gap formation and provide early bond strength.

Experimental Design:

MATERIALS:

G-CEM ONE, G-CEM ONE Adhesive Enhancing Primer (AEP) and **G-Multi Primer, RelyX Unicem 2 + RelyX Ceramic Primer, RelyX Ultimate + Scotchbond Universal (3M), Maxcem Elite + Silane Primer (KaVo Kerr), Panavia V5 + Tooth Primer** and **Clearfil Ceramic Primer Plus (Kuraray)**

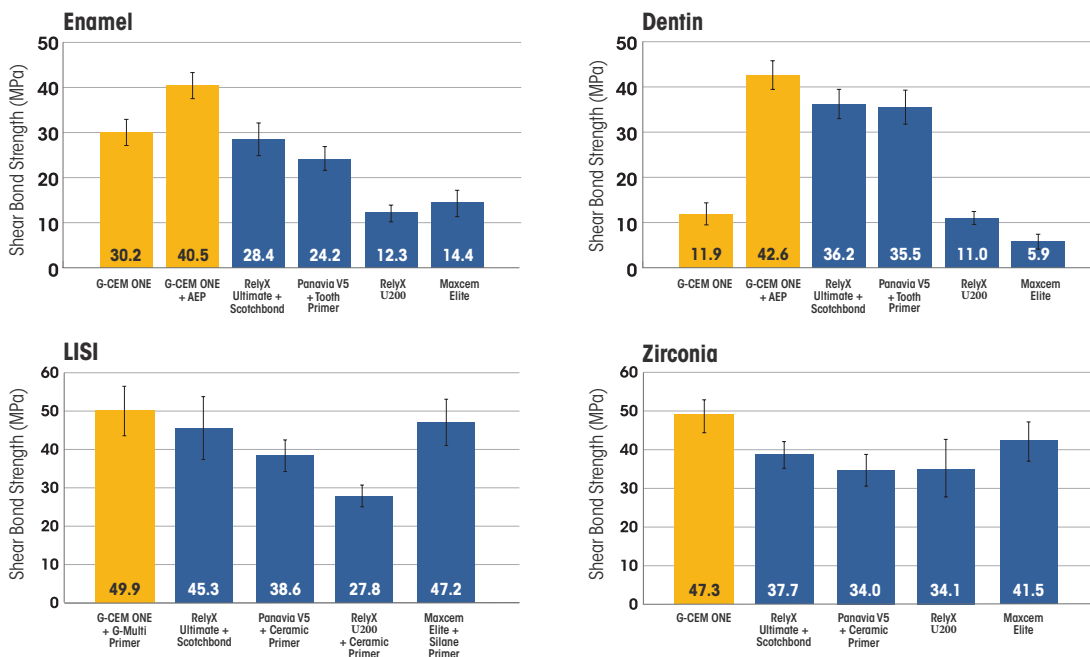
TESTS:

Substrates: Human Dentin, Human Enamel, Initial LiSi Block and Initial Zirconia
Storage Conditions: 24 hours in water

Methods:

Indirect Shear Bond Strength [n=8, N=32] to dentin, enamel, Initial LiSi and Initial Zirconia: Molars, sterilized in a 1% chloramine 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. Zirconia and LiSi plates were cut to be ~12 mm x 12 mm x 2-3 mm thick, processed according to manufacturer instruction, embedded in acrylic resin discs, finished through 600 grit diamond paper, and surfaces treated according to manufacturer instructions. The surface treatment was 9.6% hydrofluoric acid for 20 seconds to LiSi and sandblasting with 4 bar (0.4 MPa) pressure and 50 µm particles to Initial Zirconia. Test groups for adhesive bonding had their surfaces treated. Specimens were then prepared in which single-sided adhesive Teflon tape, ~0.10 mm thick, with an approximately 3 mm diameter hole is placed over the bonding site and burnished into place. 10 mm diameter metal cylinders were ground with 60 grit SiC Paper, sandblasted and primed to simulate an indirect restoration which should have a higher bond strength than the substrate being tested. A dab of the cement was placed in the center of the metal cylinder and the cylinder gently applied concentric with the hole with finger pressure before being placed in a loading jig where a 1000 g weight was applied at room temperature. The excess cement was removed by cotton without light and the load was removed then transferred to a 37°C, 100% R.H. oven carefully and dwelled for 10 minutes. They were then transferred to a container with 37°C water for 24 hours prior to shear testing. The shear bond strength test was performed on a universal testing machine (Instron model 5866) at a crosshead speed of 1 mm/min. Means and standard deviations of bond strength were calculated and reported in the results section.

Results:



Conclusion:

G-CEM ONE performed as well or better than competitive materials tested in the self-adhesive mode. When Adhesive Enhancing Primer was used, bond strength to enamel and dentin was highest among the tested groups.