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THE DENTAL ADVISOR

3110 West Liberty
Ann Arbor, MI 48103
Toll free: 800.347.1330
E-mail: info@dentaladvisor.com
Web Site: www.dentaladvisor.com

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Bond Strength of OptiBond XTR Sixth-generation, Type I Bonding Agent

Ron Yapp, M.S., Anthony Malmsten, John M. Powers, Ph.D.
THE DENTAL ADVISOR Biomaterials Research Center
Dental Consultants, Inc., Ann Arbor, Michigan

Purpose – The project evaluated the in-vitro shear bond strength of OptiBond XTR, a 6th-generation, Type I bonding agent.

Materials and Methods – The bonding agent [*OptiBond XTR*, Kerr Corporation, Lot # 548HB196C (adhesive)/564HB51F (Primer)] was applied to 600-grit silicon carbide paper ground human molar enamel and superficial dentin according to the manufacturer’s instructions. *TPH3 (DENTSPLY Caulk)* resin composite was molded into a 2.38 mm diameter cylinder on top of the bonding agent using the Ultradent specimen fabrication jig. The specimens were stored for 24 hours in 37° C water. After storage, the specimens were subjected to a shear load produced by the Ultradent shear test anvil attached to a universal test machine (Instron 5866) with the cross-head speed set at 1 mm/minute. The Ultradent shear bond strength was determined for each specimen and the averages and standard deviations were determined. Modes of failure were noted.

Results – Means and standard deviations of the shear bond strength and the modes of failure are listed in the table below.

Ultradent shear bond strengths of Optibond XTR for ground enamel and superficial dentin.		
Tissue Substrate	Bond Strength, MPa	Failure Mode
Ground Enamel	38.7 (5.9)	71% Adhesive
Ground Superficial Dentin	47.4 (8.4)	31% Adhesive

Conclusions – *OptiBond XTR* had exceptionally high values of in-vitro shear bond strength to ground human enamel and superficial dentin.

Note – *TPH3* is used as a standard composite for in-vitro bond testing.