3M™ ESPE™ Paradigm™ MZ100 Block for CEREC®

New independent studies prove the benefits of using 3M™ ESPE™ Paradigm™ MZ100 Block for CEREC®, including its enamel-like wear and high fracture toughness.

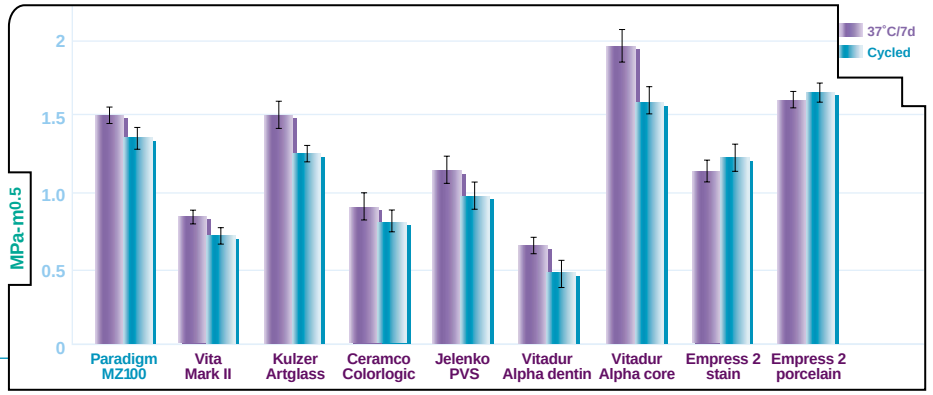
Studies presented at the 2000 and 2001 IADR/AADR meetings in Chicago and Washington compared the bond strengths, fracture toughness, clinical performance, and wear on enamel. The following graphs illustrate some of the results. Study results have been published in the Journal of Dental Research, 2000, v. 79, Special Issue: Abstracts of Papers, and Journal of Dental Research, 2001, v. 80, Special Issue: Abstracts of Papers.

YF Mansour, CA Mitchell

Division of Restorative Dentistry, Queen's University, Belfast, U.K.: Effect of Thermocycling on Fracture Toughness of Porcelain and Polyglass Materials. J Dent Res 80 (AADR Abstracts #570) 2001.

This study measured the effect of thermocycling on the fracture toughness (K_{Ic}) of dental porcelains and polyglasses used to fabricate bonded aesthetic restorations, using the chevron notch short rod method. Samples were stored isothermally (37˚C, 7 days) or thermocycled (10,000 cycles, 5˚C–60˚C). Thermocycling had an statistically significant effect on toughness. In addition, differences were seen between some of the materials tested.

FRACTURE TOUGHNESS

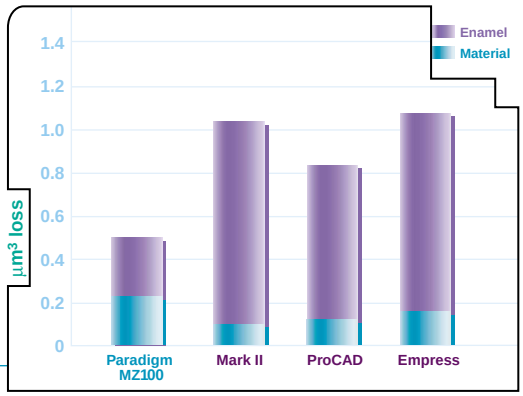


K-H Kunzelmann, J Manhart, A Mehl, R Hickel

Department of Restorative Dentistry, LMU University, Munich, Germany: The Effect of CEREC CAD/CAM Materials on the Wear of Human Enamel. J Dent Res 80 (AADR Abstracts #575) 2001.

The wear of human enamel against composite and porcelain materials for CEREC was measured on a newly developed wear simulator. The wear test comprised 50,000 cycles of a vertical load of 50 N in distilled water at room temperature. Laser scans of silicone replicas were used to measure the wear of the enamel and materials.

TOTAL VOLUME LOSS



"The total wear (material+enamel) of the composite material is far less than the total wear of the ceramic materials. No significant differences were found among the CEREC and lab-made ceramics."

3M ESPE

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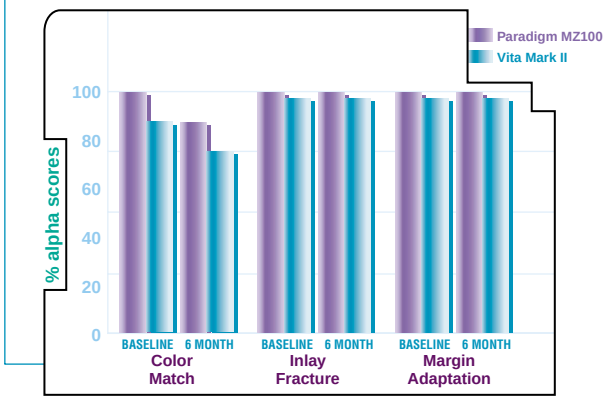
DJ Fasbinder, JB Dennison, D Heys, K Lampe

University of Michigan, Ann Arbor, MI, and University of Zurich, Zurich, Switzerland: *Clinical Evaluation of CAD/CIM-Generated Polymer Ceramic Inlays. J Dent Res 80 (AADR Abstracts #1882) 2001.*

Six-month results are presented of a longitudinal, randomized clinical trial comparing Paradigm MZ100 block and Vita™ Mark II inlays. Restorations of both materials were fabricated on a CEREC 2 and bonded with 3M™ ESPE™ RelyX™ ARC Cement. In response to cold stimulus, no sensitivity was reported for Paradigm MZ100 block at one week, and one case for Vita™ Mark II. Restorations were evaluated with a modified USPHS rating at baseline and six months.

"No sensitivity was reported in either group after two weeks, and six months. All restorations were rated clinically acceptable at six months."

CLINICAL EVALUATION

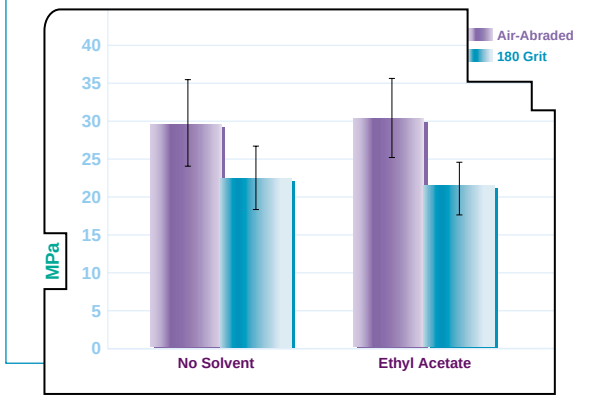


JR Sturdevant, EJ Swift Jr., SC Bayne

University of North Carolina, Chapel Hill, NC: *Cement Bond Strength to Millable Composite for CAD/CAM Restorations. J Dent Res 80 (IADR Abstracts #2479) 2000.*

In this study, the adhesion of RelyX ARC cement to Paradigm MZ100 machinable composite block is measured with respect to variables: roughening with air abrasion vs. sanded, and ethyl acetate rinse vs. no solvent wash. The 180 grit sanding mimics the standard as-milled surface. Buttons of mill block were cemented to mill block substrate with these treatements; all surfaces were treated with 3M™ ESPE™ RelyX™ Ceramic Primer, per product instructions. The results show that the solvent had no effect on adhesion. While the adhesion with the sanded surface was excellent, air abrasion notably improved the adhesion.

BOND STRENGTH



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