Tensile Bond Strength of So-called Universal Primers and Universal Multimode Adhesives to Zirconia and Lithium Disilicate Ceramics.

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Abstract

PURPOSE: To test the bond strength and durability after artificial aging of so-called universal primers and universal multimode adhesives to lithium disilicate or zirconia ceramics.

MATERIALS AND METHODS: A total of 240 ceramic plates, divided into two groups, were produced and conditioned: 120 acid-etched lithium disilicate plates (IPS e.max CAD) and 120 air-abraded zirconia plates (Zenostar T). Each group was divided into five subgroups (n = 24), and a universal restorative primer or multimode universal adhesive was used for each subgroup to bond plexiglas tubes filled with a composite resin to the ceramic plate. The specimens were stored in water at 37°C for 3 days without thermal cycling, or for 30 or 150 days with 7500 or 37,500 thermal cycles between 5°C and 55°C, respectively. All specimens then underwent tensile bond strength testing.

RESULTS: Initially, all bonding systems exhibited high TBS, but some showed a significant reduction after 30 and 150 days of storage. After 3, 30, and 150 days, Monobond Plus, which contains silane and phosphate monomer, showed significantly higher bond strengths than the other universal primer and adhesive systems.

CONCLUSIONS: The bond strength to lithium disilicate and zirconia ceramic is significantly affected by the bonding system used. Using a separate primer containing silane and phosphate monomer provides more durable bonding than do
silanes incorporated in universal multimode adhesives. Only one of five so-called universal primers and adhesives provided durable bonding to lithium disilicate and zirconia ceramic.

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