

# The Evaluation of Effect of Different Surface Treatments on Bond Strength of Resin Cements to Ceramic Material

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**Objective:** The aim of this study was to determine the effect of four different surface treatments on bond strength of resin cements to IPS e.max and IPS e.max CAD ceramic materials.

**Methods:** Two different ceramics (IPS e.max and IPS e.max CAD) were used for each test group yielding a total number of 240 specimens. According to surface treatments (no treatment, HF acid treatment, laser treatment, Cojet treatment); all ceramic specimens were divided into 4 groups. Ceramics which were divided into 4 groups according to surface treatments, were divided into 3 subgroups according to different resin cements (Maxcem Elite, Biscem ve Bifix SE) used for cementation. Following the cementation procedure, all specimens subjected to 10000 cycles of thermocycling at  $5\pm 2$  C°-  $55\pm 2$  C° (dwelling time: 30 sec, transfer time: 3 sec). Bond strength was measured by means of a shear test, using Zwick Z010 (Zwick GmbH, Ulm, Germany) universal testing machine with 0.5 mm/min. speed until failure. A stereo microscope was used to analyse the surfaces for adhesive, cohesive and mixed failure percentages. To determine the statistical significance of the differences between the mean shear bond strength values, Oneway Anova, Tukey HDS and Student t test were used.

**Results:** According to surface treatments, while the highest bond strength was obtained from the groups treated with HF acid, the lowest bond strength was obtained from the groups without surface treatment. Between all groups, the highest bond strength was obtained with the groups treated with HF acid and luted with Maxcem Elite. After shear bond strength test, under stereomicroscope the most prevalent type of failure was seen as Type I (adhesive failure) and the least prevalent type of failure was seen as Type II (cohesive failure).

**Conclusion:** Surface treatments affect the bond strength of resin cements to ceramic materials.

**Key words:** Failure mode, shear, resin cement, ceramic, surface treatment