

## **Shear Bond Strength of Porcelain to New Ceramic Alloy Systems**

*T. MARGHALANI", Boston University, MA, USA, and D. NATHANSON, Boston University, USA*

SinterKor (Pentron) is a high noble interpenetrating network ceramic alloy system utilizing a sintering technique instead of conventional casting.

**Objectives:** This study compares the shear bond strength of porcelain to the following systems: Group A: SinterKor (Pentron); Group B: RxG alloy (Pentron); Group C: Bio 2000 (Argen) and Group D: Captek (Precious Chemicals Company Inc.).

**Methods:** Ten (10) metal discs, 6.1 mm in diameter and 2.0 mm in thickness were fabricated for each alloy using the appropriate techniques. Ceramic side surfaces were finished to manufacturer recommendation, i.e. degassing of Bio 2000 and RxG, application and firing of corresponding Gold Bonders for SinterKor and Captek. Avante (Pentron) opaque porcelain was applied to all samples and fired. Avante dentine porcelain (Pentron) was applied over the opaque layer using a split mold, then fired to form a porcelain cylinder 2.75 mm in diameter and 3 mm high. Porcelain bond was tested in shear mode by applying the force to the interface of the discs using special apparatus in the Instron. Shear force for each sample were recorded.

**Results:** The following mean shear bond strengths (MPa) were obtained: Group A  $39.02 \pm 6.00$ ; Group B  $56.23 \pm 7.07$ ; Group C  $43.96 \pm 7.22$ ; Group D  $41.86 \pm 13.08$ . ANOVA and Tukey test revealed no significant difference between groups A, C, and D; but group B had significantly higher bond values ( $p < 0.05$ ) than all other groups.

**Conclusions:** The shear bond of porcelain to SinterKor is similar to bonds obtained with Bio 2000 and Captek. RxG casting alloy obtained higher porcelain bonds than the other alloys tested.