

Marginal Accuracy of Sintered Fixed Partial Dentures

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Introduction: Sintered alloys are assumed to produce superior marginal adaptation due to a reduction in fabrication steps. This study investigates the marginal accuracy of conventional and sintered alloy FPDs. **Materials and Methods:** Two sintered alloys, Group 1: SinterKor (Pentron) and Group 2: Captek (Precious Chemicals), and one conventional high noble alloy, Group 3: RxG (Pentron) were included in the study. Plastic teeth (mandibular first premolar and first molar) set in a rigid typodont were prepared for a three unit FPD. The master model was duplicated into multiple stone models. FPD frameworks (n= 10 per group) were fabricated in uniform dimensions using the specific steps for each system. All fabricated frameworks were positioned for testing on the original master model and examined for marginal accuracy under a metallurgical microscope. Porcelain was then applied to all frameworks and the FPDs were again tested for marginal accuracy.

Results: Mean marginal gaps (Microns) are shown below:

	Group 1	Group 2	Group 3
Before Porcel.	38.63 (16.75)	36.38 (20.32)	44.13 (29.72)
After Porcel.	41.95 (16.88)	40.60 (20.26)	47.88 (29.52)

For frameworks without porcelain, the mean marginal gap for group 3 was significantly larger than for group 2 ($P=.025$), but not different from group 1 ($P=.152$). There was no difference between groups 1 and 2. ($p=.727$). After porcelain application there was a significant gap increase in all groups. The mean marginal gap with porcelain for group 3 was significantly larger than for group 2 ($P=.037$), but not different from group 1 ($P=.112$). There was no difference between groups 1 and 2. ($p=.890$)

Conclusions: The sintered alloy in group 2 produced a significantly smaller marginal gap compared to the cast alloy in group 3, before and after porcelain application. Although Porcelain veneering increased the marginal gap in each group, the amount of increase was clinically irrelevant. This study confirms a potential higher marginal accuracy of sintered dental alloys.