

# 0601 Effect of Pre-heated Composite on In-Vitro Intrapulpal Temperature Rise

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**OBJECTIVES:** Measure intrapulpal temperature differences when placing and restoring with either room-temperature or pre-heated composite. **METHODS:** A divergent, deep (1mm remaining dentin thickness) Class V preparation was made on the facial surface of extracted, human bifurcated upper premolar (University HAC-approved protocol). A K-type thermocouple was placed through an opening on the lingual surface, resting against the facial pulpal wall, opposite the Class V axial wall. Tooth roots were immersed in temperature-controlled water, and a pulpal circulation was established through one root end at a physiological rate. The thermocouple output was directed to an electronic cold junction compensator (Omega) and then to a 16-bit analog-to-digital converter, after which data were displayed and captured in real-time. Prior to all runs, the intrapulpal temperature was maintained at 34°C (physiologic). The preparation was filled using composite compules (EsthetX) (either at room-temperature, or pre-heated to 54° or 60°C with the CalSet™ (AdDent) using standard clinical procedures by one person while continuously monitoring intrapulpal temperature. Temperature rise over baseline values were determined at completion of fill, contouring, prior to light-curing (pre-light), and immediately after light-curing (post-light) (20s Optilux 501). Five replications of each test condition were made. At each measurement interval, temperature rise values were compared using ANOVA and the Tukey-Kramer post-hoc test ( $\alpha=0.05$ ). **RESULTS:** Mean (SD), similar lowercase letters in columns are statistically equivalent

Composite temp	Fill	Contour	Pre-light	Post-light
Room-temp	0.02(0.36)a	0.44(0.30)a	0.52(0.54)a	5.24(0.56)a
54°C	0.92(0.19)a	1.18(0.31)b	1.18(0.36)a	5.60(0.62)a
60°C	0.76(0.19)a	0.98(0.08)b	0.92(0.26)a	5.12(0.18)a

At each stage of the restorative process, there was no significant increase in in-vitro intrapulpal temperature rise when using pre-heated composite compared to that at room-temperature (except at contour, where pre-heated was slightly higher). **CONCLUSIONS:** Use of pre-heated composite does not significantly increase intrapulpal temperature values when compared to that delivered at room-temperature. Supported in part by CAPES (grant 03/48031).

[Seq #91 - Composite Resin--Heating Effects, Fiber Reinforcement](#)

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