

# ***Composite film thickness at various temperatures***

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Background: Devices have been introduced that pre-heat composite prior to placement. Objectives: The effect of composite temperature on film thickness of a variety of commercial resin products was tested. Methods: Seven conventional composites (CC) representing a variety of filler loading and type (microfill, hybrid, packable) and five flowable (FL) composites were tested. CC and all test equipment were pre-heated in a thermostatically controlled oven to assure maintenance of composite temperature during testing. A modification of ISO Spec #4049 was used. Uncured composite (0.05 ml) was expressed onto a Mylar sheet, covered with another Mylar sheet, and pressed between two flat glass plates (150N load for 180s) at room temp (RT), 130°, or 140°F (54.4° or 60.6°C). FL composites were tested only at RT. The sandwiched, uncured specimen was removed from the oven, and resin was polymerized using a dental light curing source. Cured specimen thickness was measured at 3 locations using a digital micrometer; mean value represented specimen thickness. Five specimens were made for each test condition. Statistical analysis (ANOVA, Tukey-Kramer post hoc, alpha = 0.05) compared CC film thickness for each product among temperatures, and all CC thickness to those of RT FL products. Results: Some CC demonstrated dramatic reduction in film thickness between RT and heated thickness: reductions from 54 to 77%. Some heated CC thickness values did not decrease from those found at RT. No heated CC film thickness was decreased to the level of FL products at RT. Film thickness was equivalent for each specific CC heated between 130° and 140°F. Conclusions: Film thickness of some conventional composites (CC) was greatly reduced by heat application, but values varied greatly among brands. Heating of conventional composites does not reduce film thickness to values of flowable composites (FL) at room temperature (RT). (supported by AdDent, Inc)

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