

## Thermal Property Improvement of Silica Reinforced Epoxy Composite Specimens

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**Abstract :** In this study, the mechanical and thermal properties of epoxy composites that are reinforced with micrometer-sized silica particles were investigated by using the specimen experiments. For all specimens used in this study (from the baseline to specimen containing 70 wt% silica filler), the tensile strengths were gradually increased by 8-10%, but the ductility of the specimen was decreased by 34%, compared with those of the baseline samples. Similarly, for the samples containing 70 wt% silica filler, the coefficient of thermal expansion was reduced by 25%, but the thermal conductivity was increased by 100%, compared with those of the baseline samples. The improvement of thermal stability of the silica-reinforced specimen was confirmed to be within the experimented range, and the smaller silica particle was found to be more effective in delaying the thermal expansion of the specimens. When the smaller particle was used as filler, due to the increased specific interface area between filler and matrix, the thermal conductivities of the composite specimens were measured to be slightly lower than those of the specimens reinforced with the larger particle.

**Keywords :** carbon nanotube filler, epoxy composite, mechanical property, thermal property

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