

Thermal Insulation, Sound Insulation, and Tensile Properties of Epoxy-Silica Aerogel and Epoxy-Polystyrene Composites

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Abstract : Both thermal insulation and sound insulation play a key role in energy saving and the quality of life. In this study, the effects of different fillers, such as silica aerogel and polystyrene, on the tensile strength, thermal insulation, and sound insulation of epoxy composites have been analyzed. Results from the experimental studies show that both tensile strength and insulation properties (sound and thermal insulation) of the epoxy composite increased by the use of silica aerogel additive. Polystyrene additive significantly increases the sound absorption coefficient of the epoxy composite. Such composites offer great potential for many applications.

Keywords : epoxy composite, silica aerogel, polystyrene, tensile strength, thermal insulation, sound insulation

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