

عنوان مقاله:

Improving the Performance of the Sandwich Panel with the Corrugated Core Filled with Metal Foam: Mathematical and Numerical Methods

محل انتشار:

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خلاصه مقاله:

A new type of composite structure with a metal foam is reinforced by the metal corrugated core, called metal-foam-filled sandwich panel with a corrugated or V-frame core, is modelled, simulated, and studied in this article. All types of samples with different relative densities of the foam are tested and analyzed under the drop hammer load. The sandwich panel included two aluminium face-sheet, aluminium foams, and aluminium corrugated or V-frame cores. Mathematical and finite element models were also been developed to predict the effects of the relative density of the foam and other geometric parameters on the energy absorption. In addition, the mathematical equations based on a mass-spring-damper problem with two degree-of-freedom (DOF) were derived to evaluate the kinetic and kinematic parameters of the sandwich panel, such as velocity, acceleration, contact force, and energy absorption. It was found that the models could represent the dynamic response of the sandwich panel. Finally, in order to improve the performance of the sandwich panel, an optimization method was utilized for finding the optimum parameters which play an important role

کلمات کلیدی:

sandwich panel, Corrugated core, Metal Foam, Mathematical model, Optimization method

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