
Energy dissipation in vibration of composite shells

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The paper deals with the problems of vibration damping in composite shells. The energy approach and engineering damping theory are used to derive calculating formulas for dissipation factors and the values of relative dissipation capacity which correspond to each vibration mode of multilayered orthotropic cylindrical shells. Analogous relationships are also obtained for sandwich shells with a light (honeycomb) core and multilayered composite sheets. Numerical investigation is performed to estimate the effectiveness of carbon fiber reinforced plastics (CFRP) for large scale composite shells of high damping, the shells having various reinforcing structures. The study shows non-monotonic relationships of investigated damping characteristics versus both wave generation parameters and material orientation in the sheet layers of the sandwich shell. Obtained results can be used, for example, in the development of acoustic protection methods for space vehicles which are placing into orbit.

Keywords: *composite, shell, vibrations, damping, sandwich structure.*

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