
Modeling of elastic-dissipative properties of laminated fibrous composites

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The developed method of calculating the elastic-dissipative characteristics of polymeric composite materials of layered fibrous structure under steady cyclical is based on application of the theory of asymptotic averaging of periodic structures. We offer an algorithm for comparing different structures of layered fiber composites in terms of the realization of the highest values of their elastic-dissipative characteristics. It is based on the diagram construction of materials in the coordinates "the real part of the complex modulus of elasticity in the plane of laying of the fibers — tangent of loss angle for the same module." The algorithm may be used to search for optimum reinforcement structure of layered fiber composites. Examples of numerical modeling of elastic-dissipative characteristics of layered fibrous composites with two, three and four strands systems are given.

Keywords: viscoelastic composites laminated fibrous composites, elastic-dissipative properties, steady vibrations, tangent of loss angle, complex elastic modules, method of asymptotic averaging.

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