
Simulation of dynamic deformation processes in flexible textile composites

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A mathematical model of deforming flexible composites based on aramid fabrics under shock-wave influences is proposed. The model takes into account the deformation characteristic distinctions of this class of composite materials: the ability to deform without destruction at finite deformations, a significant dissimilarity of deformation patterns under tension and compression, the dependence of these patterns on the loading rate, the presence of pseudoplastic material properties caused by pulling the filaments from the fabric and others. Statement of the problem of flexible armor material dynamic deformation has been defined. The adaptive banded grid method has been applied for its decision in a two-dimensional formulation. An example of the numerical solution of the problem of high-speed impact of the hammer on the flexible armor material is given. Some specific effects of this class material deformation are analyzed.

Key words: *dynamic processes, flexible textile composites, numerical simulation, destruction, armor materials.*

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