

Parameter determination of hereditary models of deformation of composite materials based on identification method

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Abstract

© Published under licence by IOP Publishing Ltd. In this paper, based on the analysis of some experimental data, a study and selection of hereditary models of deformation of reinforced polymeric composite materials, such as organic plastic, carbon plastic and a matrix of film-fabric composite, was pursued. On the basis of an analysis of a series of experiments it has been established that organo-plastic samples behave like viscoelastic bodies. It is shown that for sufficiently large load levels, the behavior of the material in question should be described by the relations of the nonlinear theory of heredity. An attempt to describe the process of deformation by means of linear relations of the theory of heredity leads to large discrepancies between the experimental and calculated deformation values. The use of the theory of accumulation of micro-damages leads to much better description of the experimental results. With the help of the hierarchical approach, a good approximation of the experimental values was successful only in the first three sections of loading.

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