

THE LOAD-CARRYING CAPACITY OF STATICALLY INDETERMINATE ANNULAR PLATES MADE OF COMPOSITE

Abstract

We consider the problem on determination of load-carrying capacity of statically indeterminate circular axisymmetric annular plates made of definite class of fibrous composite material under axisymmetric lateral load at axisymmetric boundary conditions. It is considered that the composite consists of perfectly plastic matrix and thin perfectly plastic fibers.

For determination of load-carrying capacity of the considered plate we should solve the following mathematical problem. The distributed load is given to within some constant multiplier – load factor. It is required to define the load factor for which there exists statically allowable field of stress and kinematically possible field of rates of deformation compatible with this field.

For the load factor we found the formula connecting mechanical characteristics of components of composite and some typical geometric parameters of the plate. The results of numerical computations for some particular data are presented in the form of graphs.