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Modeling and optimization of the composite plateslaminated by genetic algorithm

Safer /M, Belkheir /F

Abstract : Our study made it possible to develop and test a program ofoptimization based on a technique of optimization based on theuse of a genetic algorithm. This program moreover was appliedto the resolution of several types of problems connected to theoptimal design of laminated structures. Among these problems,orientations of the folds, the material and the number of folds asvariable which were already solved . In this work, we havepresented the principles of the genetic algorithm functioning , itsapplication to the laminated composites and to the originaltechnique of coding which allows giving an account of theindustrial constraints of composites development.The flexibility of the general structure of our software allowstreatening the various types of problems like: calculation of themodule of rigidity as well as the factors of buckling and rupture.We develop the OpStrAG software to optimize the characteristicsof rigidity of the laminates and also their constraints towardsrupture and their deformations under a given loading.

Keywords : composite materials, laminated Plates, Modeling and optimizatio, genetic Algorithm.