

THE STUDY OF FIBERGLASS AND CARBON FIBER PLASTIC FAILURE RATE

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Background. Polymer composite materials (CM) are widely used in various industries, including aviation. The increase in the use of composites in the airframe design is largely due to their high strength characteristics. At the same time, the problem of repairing composite structures to extend the products life cycle during operation is acute.

Aim. In this paper the problem of maintainability of composite structures made of fabric glass and carbon fiber plastics is considered.

Methods. The conditions under which the restoration of the material is expedient are identified and described. The main types of damages of composite materials are given [1]. A comparison of various methods of repair of composite structures is given and the main criteria for choosing a repair method are investigated. Based on the studied types of repair of products made of CM [2, 3], the dependence of the deformation type and the most optimal method for restoring strength characteristics is established.

To establish the dependence of the deformation type, the nature of loading and the strength properties of fabric glass and carbon fiber plastics, tensile tests of damaged and undamaged samples are carried out. Based on the analysis of different variants of mutual arrangement of fibers of damaged and restoring parts, the most resistant to tensile loading is determined.

Results. In this paper a study of various modes of repair of composite materials samples after shock deformations is carried out. The creation of a patch on the surface of a sample from CM is considered. The paper compares the strength characteristics of the composite structure before and after damage, and also evaluates the effectiveness of the work carried out to restore the CM product.

Possible solutions to the most important technical problems of CM repair implementation are presented. The idea of the need to develop new repair methods of composite structures is substantiated.

Conclusions. Possible solutions to the most important technical problems of CM repair implementation are presented. The idea of the need to develop new repair methods of composite structures is substantiated.

Keywords: composite materials; maintainability; methods of repair.

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