

Deformation and Strength of Heat-Shielding Materials in a Long-Term Storage of Aircraft

Authors : Lyudmila L. Gracheva

Abstract : Thermal shield is a multi-layer structure that consists of layers made of different materials. The use of composite materials (CM) reinforced with carbon fibers in rocket technologies (shells, bearings, wings, fairings, inter-step compartments, etc.) is due to a possibility of reducing the weight while increasing a structural strength. Structures made of a unidirectional carbon fiber reinforced plastic based on an epoxy resin are used as load-bearing skins for aircraft fairings. The results of an experimental study of the physical and mechanical properties of epoxy carbon fiber reinforced plastics depending on temperature for different storage times of products are presented. With an increasing temperature, the physical and mechanical properties of CM are determined by the thermal and deformation properties of the components and the geometry of their distribution. Samples for the study were cut from natural skins of the head fairings.

Keywords : composite material, thermal deformation, carbon fiber, heat shield, epoxy resin, thermal expansion

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