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MODERN DESIGN AND TECHNOLOGICAL METHODS FOR INCREASING THE ELECTRICAL CONDUCTIVITY OF COMPOSITE AIRCRAFT CABINS

One of the most important criteria for ensuring flight safety is the ability of an aircraft to operate in conditions of lightning and high voltage lightning discharges. Lightning striking an aircraft can cause critical damage to the fuselage, as

well as malfunction of electrical equipment, radio navigation and power plants. Therefore, an important component in the design is such a criterion as lightning protection. The most important influence on lightning protection is the electrical conductivity of the ship's cabin. Currently, manufacturers are increasingly using composite materials in the manufacture of cabins. The composite material is a multilayer frame impregnated with a binder and does not conduct electrical current. To fulfill the lightning protection conditions, an electrically conductive layer is introduced into the structure. It is customary to separate constructive and technological approaches. Structural methods are usually divided into such methods as the use of conductive materials, the use of layers with conductive properties and the reinforcement of conductive elements. The use of conductive materials refers to the use of composite materials with high electrical conductivity, such as carbon nanotubes or metal particles [1]. The use of layers with conductive properties is used to create special layers in the composite structure that can provide electrical conductivity, for example, introducing a layer in the form of a mesh of different shapes and cell sizes, using thin sheets of foil [2]. Conductive reinforcement refers to the use of conductive inserts or reinforcement of cabin parts with conductive materials to form effective electrical contact, for example in areas where power electronics or radio navigation devices are located [3]. Technological methods include the use of various methods of deposition and spraying of metals onto the prepared prepreg, the use of conductive pastes and binders, and the application of special coatings containing conductive additives to the surface of the cabin [4]. Very often, depending on the desired result, combinations of design and technological methods for ensuring electrical conductivity are used. These methods make it possible to achieve the required electrical conductivity and lightning protection in composite structures, while maintaining the necessary characteristics of lightness and strength, which leads to increased flight safety in general.

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