Multilayer Microwave Absorbers Based on 3D Aluminum-Containing Spiral Elements

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Abstract: The paper presents the patterns of change of the electromagnetic radiation absorption coefficient values of in the frequency range of 2.0–17.0 GHz for an aluminum-foiled polymer film onto which three-dimensional spiral elements formed from aluminum foil with a thickness of ~20.0 μm are attached. These patterns are presented depending on the diameter of these elements. Taking these patterns into account, the authors developed a technology for the manufacture of multilayer microwave absorbers based on three-dimensional spiral elements made of aluminum foil. This technology involves thermopressing the construction in the form of identical fragments of a synthetic non-woven fibrous material, between which 3D spiral elements made of aluminum foil are distributed, and adhesively bonding the resulting structure to a fragment of aluminum-foiled polymer film. Absorbers manufactured in accordance with the developed technology are characterized by a wider effective absorption band (12.0 GHz) compared to similar ones. They are also flexible and lightweight. This makes them suitable for use in creating partitions for zoning anechoic chambers or for covering the walls of these chambers.

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